

AMAKUSANTHURA AND *APANTHURA*
(CRUSTACEA: ISOPODA: ANTHURIDAE)
WITH NEW SPECIES FROM TROPICAL AUSTRALIA

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Abstract

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The genera *Amakusanthura* and *Apanthura* are redefined. *Apanthuretta* Wägele is synonymised with *Amakusanthura*. A key to known Australian species of *Amakusanthura*, *Apanthura* and the related genus *Apanthuropsis* is presented.

Amakusanthura coppingeri (Barnard), 13 new species of *Amakusanthura* Nunomura (*A. agonis*, *A. angophora*, *A. brachyscome*, *A. dodonaea*, *A. eugenia*, *A. goodenia*, *A. hibbertia*, *A. kingia*, *A. lechenaultia*, *A. melaleuca*, *A. pandorea*, *A. tristania* and *A. wahlenbergia*) and four new species of *Apanthura* Stebbing (*A. kennedia*, *A. pultenaea*, *A. restio* and *A. stipa*) are described from sedimentary and reef environments of tropical Australia.

It is noted that oostegite-bearing females have never been recorded for either of these two genera and that their reproductive process is unknown. The tropical fauna described here does not include any of the species known from south-eastern Australia but its extent across northern Australia is unclear. *Amakusanthura* is richest in species in tropical bays and *Apanthura* richer in temperate habitats.

Introduction

Recently we described from south-eastern Australia nine new species of *Apanthura* Stebbing and three new species of *Apanthuretta* Wägele (Poore and Lew Ton, 1985). More lately it has been realised that *Apanthuretta* is a junior synonym of *Amakusanthura* Nunomura and that this genus is widespread, abundant and rich in species in tropical Australia. This paper describes 13 new species of *Amakusanthura*, redescribes *A. coppingeri* (Barnard), and describes four new species of *Apanthura* from this region.

A key to the identification of all Australian species of *Amakusanthura* and *Apanthura* and the related genus *Apanthuropsis* is presented.

The material for this contribution has come from our own collections and others acknowledged at the end of the paper. A large part was made available to us by Alastair Birtles and Peter Arnold, James Cook University of North Queensland, whose Three Bays Survey (TBS) was carried out between 1974 and 1977 near Townsville. Most is lodged in the Museum of Victoria, Melbourne (NMV), with representative specimens in the Aus-

tralian Museum, Sydney (AM), the Northern Territory Museum, Darwin (NTM), and the Queensland Museum, Brisbane (QM). Specific epithets have been chosen from genera of the Australian flora and are used as nouns in apposition. This follows a pattern established for *Paranthura* by Poore (1984). The abbreviations P1-P7 are used for pereopods 1-7 and UN and UX for uropodal endopod and exopod. The head with antennae and pleon and telson are figured in dorsal and often in lateral view.

Each species is illustrated fully rather than being described in words in detail. Instead short diagnoses are given with remarks on critical specific characters. Mouthparts are not figured because they provide little useful taxonomic information. Mouthparts typical of the genus were figured by Poore and Lew Ton (1985) and Wägele (1981a).

The new species are distinguished by subtle differences in the shape of the telson, uropods and pereopods. The elongation of the telson and uropods of males of *Amakusanthura* made them difficult to assign to species reliably. This is in contrast to males of *Apanthura* which are often highly

and individually modified and greatly help in distinguishing species. The collections of the Museum of Victoria and the Australian Museum contain registered unidentified males of both genera from all the regions and habitats sampled. Identification of males from the bays near Townsville where several species co-occur was particularly difficult.

In this study, as in our work on south-eastern Australian species, several hundred individuals of the two genera were examined and identified. Of 399 tropical specimens 34 (9%) were fully adult males or submales. Submales have multiarticulate antenna 1 flagella but lack aesthetascs and fully developed appendices masculinae. No oostegite-bearing females were found. Females are relatively abundant in many other anthurid genera but their absence in collections of *Apanthura*, *Amakusanthura* and incidentally of *Haliophasma* raises questions about the reproductive process in these genera. Swollen (possibly gravid) juveniles and mancae are frequent but more careful sampling and life history studies are required to determine how brooding takes place, if it occurs at all.

Distribution

This study brings to 17 the number of species of *Amakusanthura* known from Australia and to 13 the number of species of *Apanthura*. Even given that sampling of different habitats and areas of the coast is uneven some trends in the distribution of genera and species are apparent.

The most intensively sampled areas are Victorian bays and shelf, bays in New South Wales, Moreton Bay and bays near Townsville, Queensland, the North-west Shelf and some islands of the Great Barrier Reef. In general species of both genera are more common in muddy bays than in coarser sediments of the shelf. None is found in estuarine environments. Most species are locally endemic, tropical and temperate faunas being totally exclusive.

The three bays near Townsville comprise the area richest in species, especially of *Amakusanthura*. Only one of these also occurred on the North-west Shelf. Although the North-west Shelf was probably less intensively sampled for small animals than elsewhere, samples from this region are rich in other isopods. The initial indication therefore is that the eastern tropical shelf is richer in species of *Amakusanthura* than the west and is richer than temperate regions. Because the north coast is virtually unknown the northerly and westerly limits of this fauna are unknown. Interestingly, the only species known from deep-water sediments of northern Australia (*A. coppingeri*) was rediscovered in

the north-west but not near Townsville. For similar reasons the southern limits of species of *Amakusanthura* are unknown but only one occurs as far south as Moreton Bay, southern Queensland.

It appears that *Amakusanthura* is most diverse in tropical sediments, especially in north Queensland, while *Apanthura* is more diverse in temperate environments.

Amakusanthura Nunomura

Amakusanthura Nunomura, 1977: 79-80.

Apanthuretta (nomen nudum) Wägele, 1981a: 85, 112, fig. 37.

Apanthuretta Wägele, 1981b: 134-5. — Poore and Lew Ton, 1985: 136.

Diagnosis. Integument smooth, sometimes pigmented. Eyes present or not visible. Antenna 1 flagellum short, of 3 articles, the last short, bearing 3 aesthetascs. Antenna 2 flagellum short, of 2-4 articles. Mandibles symmetrical, not sexually dimorphic; incisor, lamina dentata and blunt molar present; palp 3-articled, article 3 one-third length of article 2 and with 3-4 terminal setae. Maxilliped bearing an acute filamentous endite with terminal seta; palp of 3 articles, article 1 wider than long; article 2 usually with a row of mesial setae; article 3 oblique, subterminal, much smaller than 2, with 4-5 apical setae.

Pereopod 1, propodal palm stepped (sometimes weakly toothed), with stout mesial setae. Pereopods 2 and 3 with propodus only little more robust than on posterior pereopods. Pereopods 4-7 with triangular-trapeziform carpus, with free anterior margin.

Pleon longer than wide; pleonites fused or often pleonites 1-4 separated dorsally by shallow integumental grooves, 4-5 fused dorsally.

Uropodal endopod as long as peduncle, its margin setose; exopod narrow and with a sinuous dorsal margin, or with an obscure dorsal lobe.

Male head smaller than in juvenile, with broadened flattened rostrum, antenna 1 flagellum with more than 10 isometric articles each bearing numerous aesthetascs, much longer than head. Male pereopod 1 not grossly modified. Telson narrower, with mid-dorsal longitudinal depression.

Type species. *Amakusanthura longiantennata* Nunomura, 1977 (original designation).

Remarks. This diagnosis is essentially Poore and Lew Ton's (1985) diagnosis of *Apanthuretta* updated to make it comparable with that required to diagnose all other anthurid genera. Examination of the holotype of *Amakusanthura longiantennata*

Key to Australian species of *Apanthura*, *Apanthuropsis* and *Amakusanthura*

This key will distinguish anthurid species in which the maxillipedal palp is of three articles and the carpus of pereopods 4-7 is triangular, not rectangular. Species are distinguished by very subtle differences which are often difficult to quantify; the user is advised to consult the figures when in doubt. Special care should be taken with interpretation of the shape of the telson, uropodal rami and the propodus of pereopod 1. Species marked * are from south-eastern Australia and were figured and described by Poore and Lew Ton (1985). *Apanthura zeewycae* was described from the Houtman Abrolhos Islands, Western Australia, by Kensley and Poore (1982).

1. Pereopods 2 and 3 with propodus little smaller than that of pereopod 1, ovoid; maxilliped without endite, article 3 longer than wide; mandibles asymmetrical, molars fitting as tooth and socket *Apanthuropsis richea**
- Pereopods 2 and 3 with propodus different from that of pereopod 1, elongate; maxilliped with endite, article 3 wider than long or barely longer than wide; mandibles symmetrical, with flat opposing molars 2
2. Pleonites 1-5 indistinguishable dorsally (except in some males); male antenna 1 flagellum of about 10 articles *Apanthura* . . . 3
- Pleonites, except 4-5, distinguished by dorsal grooves (rarely 1-5 indistinguishable); male antenna 1 flagellum of at least 15 (usually about 20) articles *Amakusanthura* . . . 16
3. Pereopods 2-7 having merus and carpus (and propodus to lesser extent) posteriorly convex and richly setose; antenna 1, article 2 with at least 6 long lateral setae; uropodal endopod having distal and lateral setal rows separated by distinct hiatus 4
- Pereopods 2-7 merus-propodus with straight posterior margins and few setae; antenna 1, article 2 with fewer than 3 long lateral setae; uropodal endopod having continuous distolateral setal row 6
4. Telson having lateral margins convex, dorsal setae in pairs near midline; male pereopod 1 with a palmar tooth *Apanthura callitris**
- Telson having lateral margins straight or concave distally, dorsal setae near margin; male pereopod 1 without a palmar tooth 5
5. Telson tapering from proximal third; male pereopod 2 with a truncate blade on palm and setose triangular carpus; male pereonite 1 without ventral keel *Apanthura lambertia**
- Telson tapering only on distal third; male pereopod 2 with straight palm and strong lobe on carpus; male pereonite 1 with ventral keel *Apanthura isotoma**
6. Pleonal grooves visible dorsolaterally 7
- Pleonal grooves visible only ventrolaterally 8
7. Not pigmented; male pereopod 1 without palmar tooth, carpus expanded as a tooth opposing dactylus *Apanthura mirbelia**
- Pigmented; male pereopod 1 not as above *Apanthura stipa* (figs. 35, 36)
8. Pereopod 1 propodus 1.5 times as long as greatest width; telson with narrowly rounded apex *Apanthura zeewycae*
- Pereopod 1 propodus twice as long as greatest width; telson with broadly rounded apex 9
9. Uropodal endopod about 1.3 times as long as wide; telson with transverse row of long setae at two-thirds mark . . *Apanthura restio* (figs. 33, 34)
- Uropodal endopod more than 1.5 times as long as wide; telson with scattered long setae on distal third 10
10. Pigmented; telson 2.5 times as long as wide; pereopod 1 palm oblique, with well developed conical tooth; male with large ventral swelling at base of maxillipeds; male pereopod 1 with strong tooth on pereopod 1 *Apanthura xanthorrhoea**

- Not pigmented; telson less than twice as long as wide (rarely more so); pereopod 1 palm axial, with small conical tooth; male with poorly developed chin or none; male pereopod 1 with tooth on carpus similar to juvenile . 11
11. Telson with numerous lateral setae on distal third; head with prominent ventral lobe at base of maxillipeds *Apanthura thryptomene** . 12
- Telson with 1-2 pairs of lateral setae about three-quarters way along; head without ventral lobe 12
12. Telson 2.3 times as long as wide 13
- Telson twice as long as wide 14
13. Pereopod 1 palm axial, long, with tooth *Apanthura drosera** . 14
- Pereopod 1 palm oblique, short, with step *Apanthura kennedia* (figs. 29, 30)
14. Telson with narrowed triangular posterior half; uropodal endopod twice as long as wide, tapering *Apanthura pultenaea* (figs. 31, 32)
- Telson with rounded apex; uropodal endopod less than twice as long as wide, moderately tapering 15
15. Antenna 1, article 2 with 1 short lateral seta; telson apex broadly rounded *Apanthura styphelia** . 15
- Antenna 1, article 2 with 2-3 long lateral setae; telson apex narrowly rounded *Apanthura banksia** . 16
16. Pleonites 1-5 not separated by transverse grooves 17
- Pleonites 1-4 separated by transverse grooves 18
17. Telson with few distal setae, lateral margins convex *Amakusanthura agonis* (figs. 2, 3)
- Telson with numerous distal setae, lateral margins angular *Amakusanthura angophora* (figs. 4, 5)
18. Uropodal endopod exceeding telson (except in males) 19
- Uropodal endopod as long as or shorter than telson 23
19. Telson with concave lateral margin about two-thirds way along; adults not longer than 7 mm 20
- Telson with straight or convex lateral margins distally; adults longer than 8 mm 21
20. Uropodal endopod more than twice as long as wide; narrowed posterior portion of telson almost half total length; pereopods 4-7, propodus rectangular *Amakusanthura wahlenbergia* (figs. 27, 28)
- Uropodal endopod less than twice as long as wide; narrowed posterior portion of telson one-third total length; pereopods 4-7, propodus tapering *Amakusanthura goodenia* (figs. 13, 14)
21. Telson with straight distolateral margins, with 2 longitudinal rows of setae distally *Amakusanthura coppingeri* (figs. 7, 8)
- Telson with convex distolateral margins, with few dorsal setae 22
22. Telson apex broad, lateral margins thin and expanded; telson as long as pleon *Amakusanthura melaleuca* (fig. 22)
- Telson apex narrow, lateral margins not thin; telson longer than pleon *Amakusanthura pimelia** . 23
23. Uropodal exopod with distal notch or dorsal margin decidedly discontinuous; adults longer than 14 mm 24
- Uropodal exopod dorsal margin convex, at most a shallow concavity distally; adults usually less than 10 mm 25
24. Telson strongly domed; pereopods richly setose posteriorly *Amakusanthura hibbertia* (figs. 16, 17)
- Telson not strongly domed; pereopods with few posterior setae *Amakusanthura pandorea* (figs. 23, 24)
25. Telson with broadly rounded apex (e.g., fig. 9) 26
- Telson with acutely rounded apex (e.g., fig. 12) 29
26. Telson apex with distally upturned rim 27

- Telson apex not upturned 28
- 27. Telson apex very broad, almost truncate; uropodal endopod 1.5 times as long as wide *Amakusanthura brachyscome* (fig. 6)
- Telson apex only moderately broad; uropodal endopod twice as long as wide *Amakusanthura dodonaea* (figs. 9, 10)
- 28. Telson slightly domed; pereopod 1 palm without tooth *Amakusanthura tristania* (figs. 25, 26)
- Telson strongly domed; pereopod 1 palm with definite step *Amakusanthura olearia**
- 29. Telson as long as pleon; pereopod 1 palm without tooth; uropodal exopod with convex dorsal margin *Amakusanthura kingia* (figs. 18, 19)
- Telson longer than pleon; pereopod 1 palm with tooth or step 30
- 30. Telson flat, about twice as long as wide; uropodal exopod about twice as long as wide *Amakusanthura eugenia* (figs. 11, 12)
- Telson domed, 2.5 times as long as wide; uropodal exopod more than twice as long as wide 31
- 31. Uropodal exopod with dorsal margin sinuous; telson apex moderately broadly rounded *Amakusanthura correa**
- Uropodal exopod with distinct distal notch in dorsal margin; telson apex narrowly rounded *Amakusanthura lechenaultia* (figs. 20, 21)

Nunomura, 1977 revealed few differences from more typical *Apanthuretta*. The holotype is a male differing from species assigned to *Apanthuretta* only in the absence of pleonal grooves. Although Nunomura noted "demarcation of pleonal somites visible" and figured partial sutures we could see none on his specimen. The pleon is longer than wide as figured by Nunomura (and as in *Apanthuretta*). We refigure pereopod 1 (Fig. 1) to show the stout mesial setae typical of species previously assigned to *Apanthuretta*. The telson and maxilliped are lost. Pleonal grooves were discussed by Kensley (1980) and again by Poore and Lew Ton (1985). It is now our view that the grooves are not of generic value; they are absent in some Australian species as well as in *A. longiantennata*. Besides, *A. longiantennata* shows no unique apomorphy which might sug-

gest that it is generically different. We are forced therefore to synonymise *Apanthuretta* with *Amakusanthura*.

Species removed from *Apanthura* or *Apanthuretta* to *Amakusanthura* are: *Apanthura africana* Barnard, 1914, *A. californiensis* Schultz, 1964, *A. coppingeri* Barnard, 1925, *A. dubia* Barnard, 1914, *A. inornata* Miller and Menzies, 1952, *A. libyana* Negoescu, 1980, *A. magnifica* Menzies and Frankenberg, 1966, *A. mana* Kensley, 1979, *A. motasi* Negoescu, 1980, and *A. significa* Paul and Menzies, 1971; and *Apanthuretta correa* Poore and Lew Ton, 1985, *A. lathrida* Wägele, 1981, *A. pinelia* Poore and Lew Ton, 1985, *A. pori* Wägele, 1981, and *A. olearia* Poore and Lew Ton, 1985. Full synonymies were given by Negoescu and Wägele (1984) or Poore and Lew Ton (1985).

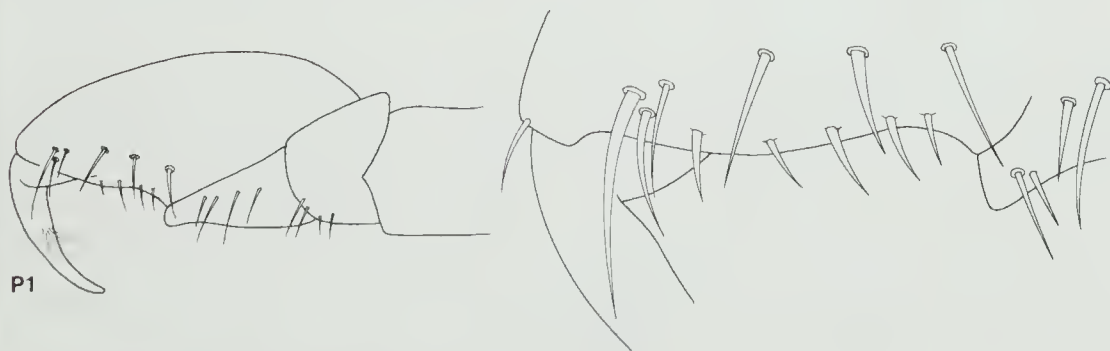


Figure 1. *Amakusanthura longiantennata*. Holotype male.

Amakusanthura is differentiated from the related genus *Apanthura* by a more elongate pleon and by a long male antennal flagellum. The similarities of *Apanthuretta* (and therefore of *Amakusanthura*) to other anthurid genera were discussed by Poore and Lew Ton (1985).

***Amakusanthura agonis* sp. nov.**

Figures 2, 3

Material examined. 49 juveniles; 5.4-12.0 mm.

Holotype. Juvenile, 10.2 mm, NMV J12254 (with slide). Qld, Cleveland Bay (19°11'S, 146°53'E), coarse silt, P. Arnold, 8 Oct 1975 (TBS stn).

Paratypes. Qld, Bowling Green Bay, Cleveland Bay and Halifax Bay, silt, 5-13 m (TBS stns), NMV J12250-J12253, J12255-J12265, J12267, J12269, J12272-J12278 (31 specimens); AM P36770(1), P36771(1); QM W12163(1).

Other material. Qld, same localities, NMV collections (8); QM W12164(1). Triangular Island (22°23'S, 150°30'E), J. Lewis, 1981-1982, NMV J12279-J12282(4).

WA, North-west Shelf, 19°58'S, 117°49'E, 42 m, 26 Jun 1983, (CSIRO stn D2), NMV J12283(1).

Diagnosis. Not pigmented. Pereopod 1 propodus anterior margin gently curved, length twice greatest width; palm oblique, distally straight, without tooth, mesial surface concave. Pereopod 2 carpus with roundly lobed posterodistal margin. Pleon with deep lateral epimera but no dorsal grooves. Uropodal endopod shorter than telson, triangular, little longer than wide, lateral margin oblique. Exopod 2.7 times as long as wide, dorsal margin sinuous, with no dorsal lobe. Telson strongly and broadly domed, its highest point almost flat, tapering to broad apex, lateral flanges narrow, with few dorsal setae.

Male. Unknown.

Distribution. Central Queensland, bays, 5-13 m, silty sediments; North-west Shelf, 42 m.

Remarks. *Amakusanthura agonis*, one of the larger tropical species of the genus, is recognised by the strongly domed telson and especially narrow uropodal exopod. *Amakusanthura agonis* is one of only two Australian species of the genus (the other being *A. angophora*) in which pleonal grooves are not seen. It differs from *A. angophora* in having fewer setae on the telson. Although this species lacks dorsal pleonal grooves it is not a member of *Apanthura*. Its elongate pleon, narrow uropodal exopod and simple palm on pereopod 1 are typical of *Amakusanthura*. Unfortunately males are unknown so confirmation from antenna 1 is not possible.

The species is the most abundant of all *Amakusanthura* in the Townsville bays. Most of

the material comes from the area around Townsville but a single specimen from the North-west Shelf which could not be distinguished from the rest suggests the species may be widespread in tropical Australia. If so it is the only species of the genus so distributed.

***Amakusanthura angophora* sp. nov.**

Figures 4, 5

Material examined. 3 submales, 18 juveniles; 4.1-8.8 mm.

Holotype. Juvenile, 7.7 mm, NMV J12291 (with slide). Qld, Halifax Bay (19°08'S, 146°43'E), 7 m, coarse silt, P. Arnold, 10 Dec 1975 (TBS stn).

Paratypes. Qld, Bowling Green Bay, Cleveland Bay and Halifax Bay, silt and very fine sand, 3-11 m (TBS stns), NMV J12287-J12290(5), J12292(1), J12293(1), J12295(1), J12296(1), J12297 (submale, 8.2 mm), J12298(1), J12300(2 submales); AM P36772(1), P36773(1); QM W12165(1).

Other material. Qld, same localities, NMV and QM collections (3).

Diagnosis. Not pigmented. Pereopod 1 propodus anterior margin gently curved, length twice greatest width; palm slightly oblique, proximally convex and distally concave, without tooth. Pereopod 2 carpus with angled posterodistal margin. Pleon with deep lateral epimera but no dorsal grooves. Uropodal endopod shorter than telson, triangular, apex obliquely truncate, about 1.2 times as long as wide. Exopod 2.5 times as long as wide, dorsal margin essentially convex, with no dorsal lobe. Telson dorsally flat over most of width and steep sided, tapering to a broadly rounded apex, with thin angled lateral flanges at widest point, distally especially setose.

Male. Only submale known. Antenna 1 flagellum of 15 articles reaching to posterior margin of pereonite 2. Head reduced and with enlarged eyes. Pereon, pleon and pereopods much as in juvenile. Telson with a narrow mid-dorsal depression.

Distribution. Central Queensland, bays, 3-11 m, silty and fine sand sediments.

Remarks. *Amakusanthura angophora* is most easily separated from *A. agonis* with which it co-occurs by its very flat setose telson. Both lack pleonal sutures but are not members of *Apanthura* because of their elongate pleons, narrow uropodal exopods and simple pereopod 1 palm. The submale of this species has a 15-artieled antennal flagellum, longer than typical of *Apanthura*.

***Amakusanthura brachyscome* sp. nov.**

Figure 6

Material examined. 1 submale, 19 juveniles; to 9.6 mm.

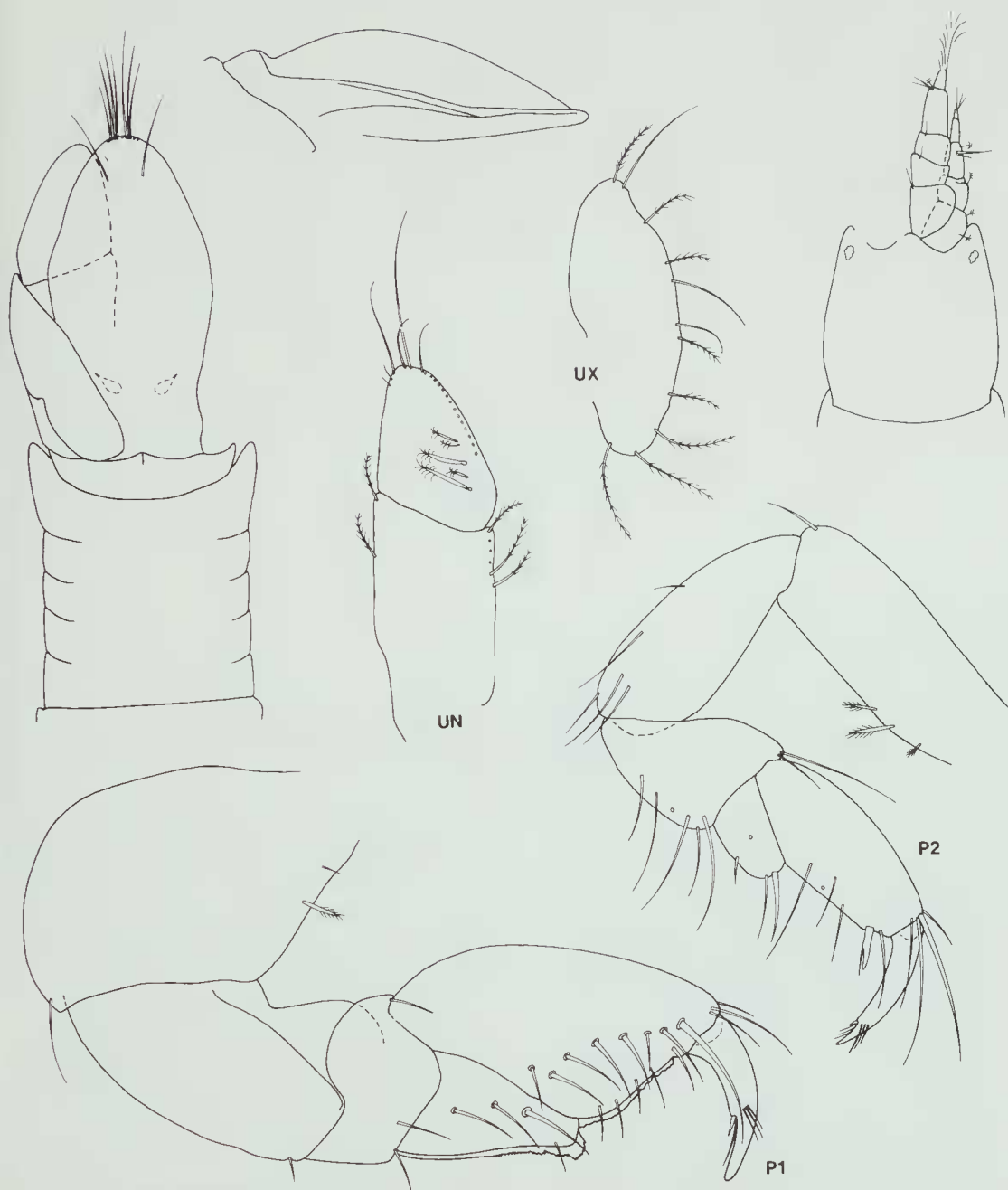


Figure 2. *Amakusanthura agonis*. Holotype juvenile.

Holotype. Juvenile, 9.6 mm, NMV J12301. Qld, Townsville bays, P. Arnold, 1974-1977 (unrecorded TBS stn).

Paratypes. Qld, Bowling Green Bay and Halifax Bay,

3 m (TBS stns), NMV J12302-J12304(3); AM P36766(1). Triangular Is. (22°23'S, 150°30'E), J. Lewis, 1981-1982, NMV J12305(1), J12306(1). Middle Banks, Moreton Bay, S Cook, 1984, NMV J12307(7), J12308(submale); QM W12167(5).

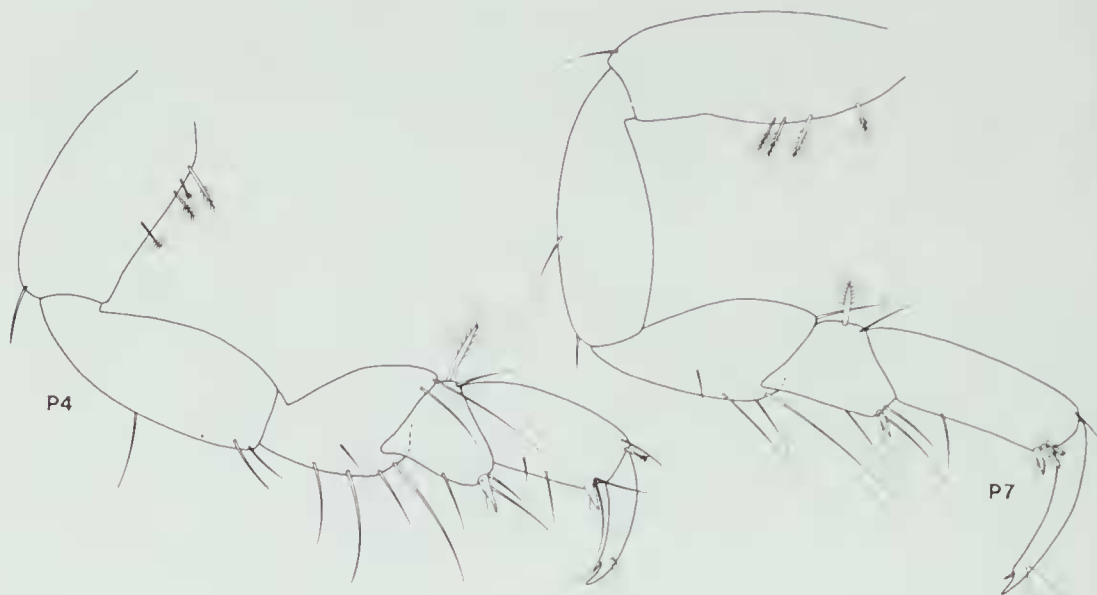


Figure 3. *Amakusanthura agonis*. Holotype juvenile.

Diagnosis. Not pigmented. Pereopod 1 propodus anterior margin parallel to carpal suture over most of its length, length 2.1 times width; palm oblique, short, with strong step at midpoint. Pereopod 2 carpus with roundly lobed posterodistal margin; propodus strongly tapering. Pleonites 1-4 separated by dorsal grooves. Uropodal endopod as long as telson, triangular-ovoid, apex rounded, 1.3 times as long as wide. Exopod 2.4 times as long as wide, with a long broad distoventral lobe and sinuous dorsal margin. Telson slightly dorsally domed proximally, more concave distally, tapering to a very broad apex, lateral margins gently convex, with few dorsal setae.

Distribution. South and central Queensland, shallow bay sediments.

Remarks. *Amakusanthura brachyscome* is distinguished by its broad and distinctly upturned telsonic apex. It is similar to *A. dodonaea* which has a narrower telson and narrower uropodal endopod. This is the only tropical species of the genus distributed as far south as Moreton Bay.

***Amakusanthura coppingeri* (Barnard)**

Figures 7, 8

Paranthura australis.—Miers, 1884: 311.—Haswell, 1884: 1012 (not Haswell, 1881, nomen dubium).

Apanthura coppingeri Barnard, 1925: 142, pl. 4 fig. 12.—Nierstrasz, 1941: 241.

Apanthuretta coppingeri.—Poore and Lew Ton, 1985: 136.

Material examined. 3 juveniles; 7.8-9.0 mm.

Holotype. Juvenile, BMNH 1882.7, Northern Territory, Dundas Strait (11°22'S, 131°40'E), 17 fm (31 m), "Alert" collection.

Other material. NT, Oxley Is. (11°00'S, 132°49'E), 14 m, muddy sand, G.C.B.Poore, 21 Oct 1982, NTM Cr4067(1).

WA, North-west Shelf, 19°29'S, 118°53'E, 40 m, 12 Feb 1983, (CSIRO stn B8), NMV J11248(1).

Diagnosis. Not pigmented. Pereopod 1 propodus anterior margin gently curved, length twice greatest width; palm axial, with strong step. Pereopod 2 carpus with roundly produced posterodistal margin. Pleonites 1-4 separated by dorsal grooves. Uropodal endopod exceeds telson, elongate, 2.2 times as long as wide, distally rounded. Exopod twice as long as wide, with a short distoventral lobe, dorsal margin evenly convex. Telson only moderately domed, tapering strongly to an acute apex, distolateral margins slightly concave, dorsal setae in pairs distally.

Male. Unknown.

Distribution. North-western Australia, shallow sedimentary habitats, 14-40 m.

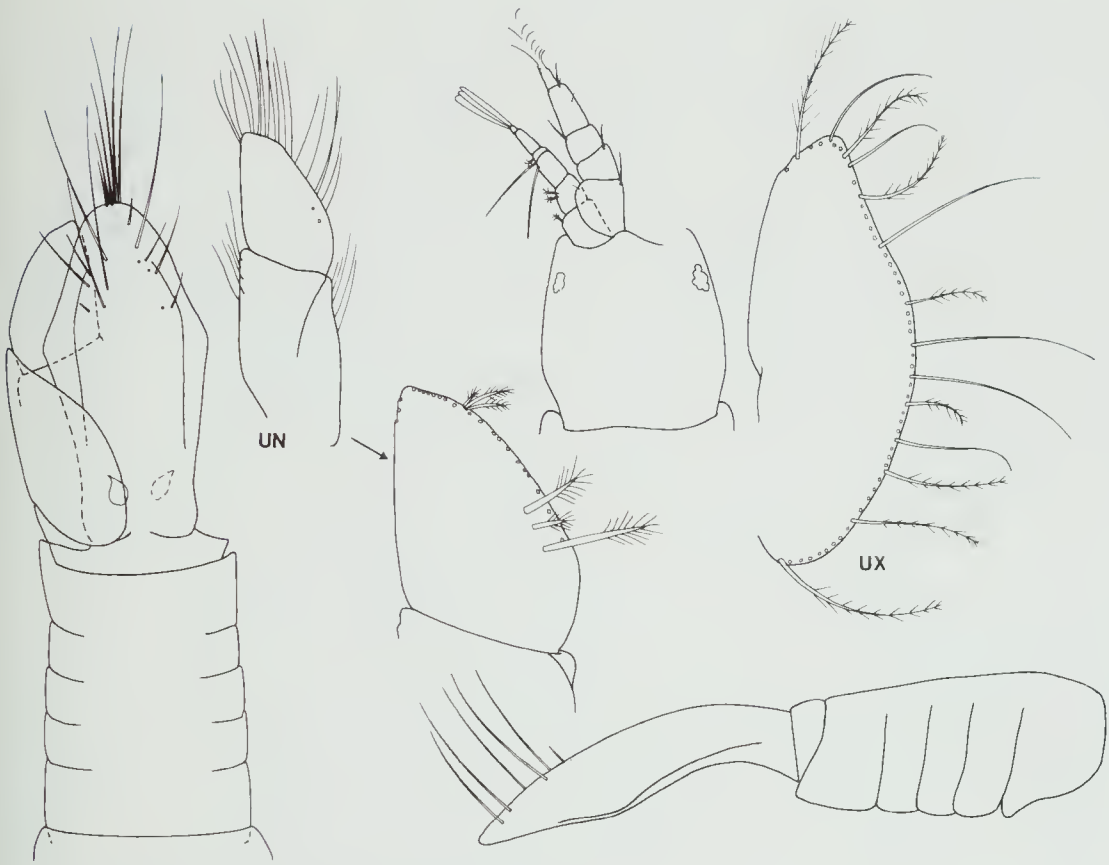


Figure 4. *Amakusanthura angophora*. Holotype juvenile.

Remarks. Miers (1884) recognised that his specimen was probably not the same as that described by Haswell (1881) and his error was corrected by Barnard. Until recently only the type specimen existed but the marine fauna of north-western Australia is little known. The species is characterised by its especially acute telson and elongate uropodal endopod.

***Amakusanthura dodonaea* sp. nov.**

Figures 9, 10

Material examined. 3 submales, 21 juveniles; 3.2-9.2 mm.

Holotype. Juvenile, 5.5 mm, AM P36774. Qld, One Tree Is. (23°30'S, 152°05'E), central lagoon, 3 m, C. Short and J. Young, 17 Oct 1979.

Paratypes. Qld, Lizard Is. (14°40'S, 145°25'E), various localities and dates, to 15 m, AM P29644(2), P26645(1), P29646(1 + submale, 4.2 mm), P29647(1), P36775(1); NMV J12309(1), J12310(1).

Diagnosis. Rarely pigmented. Pereopod 1 propo-

dus curved proximally and parallel to carpal suture distally, length twice greatest width; palm oblique, with strong convexity at midpoint. Pereopod 2 carpus with barely lobed posterodistal margin. Pleonites 1-4 separated by dorsal grooves. Uropodal endopod as long as telson, elongate, almost twice as long as wide. Exopod 2.1 times as long as wide, with acute distoventral lobe, widest distally. Telson strongly domed anteriorly, thinner and upturned laterally and especially around distal margin, tapering to broadly rounded apex, with few dorsal long setae. Male. Only submale known. Antenna 1 flagellum of 13 articles, reaching to middle of pereonite 3. Head smaller, with broad rostrum and large eyes. Telson dish-shaped posteriorly.

Distribution. Great Barrier Reef islands, lagoon sediments.

Remarks. *Amakusanthura dodonaea* is best charac-

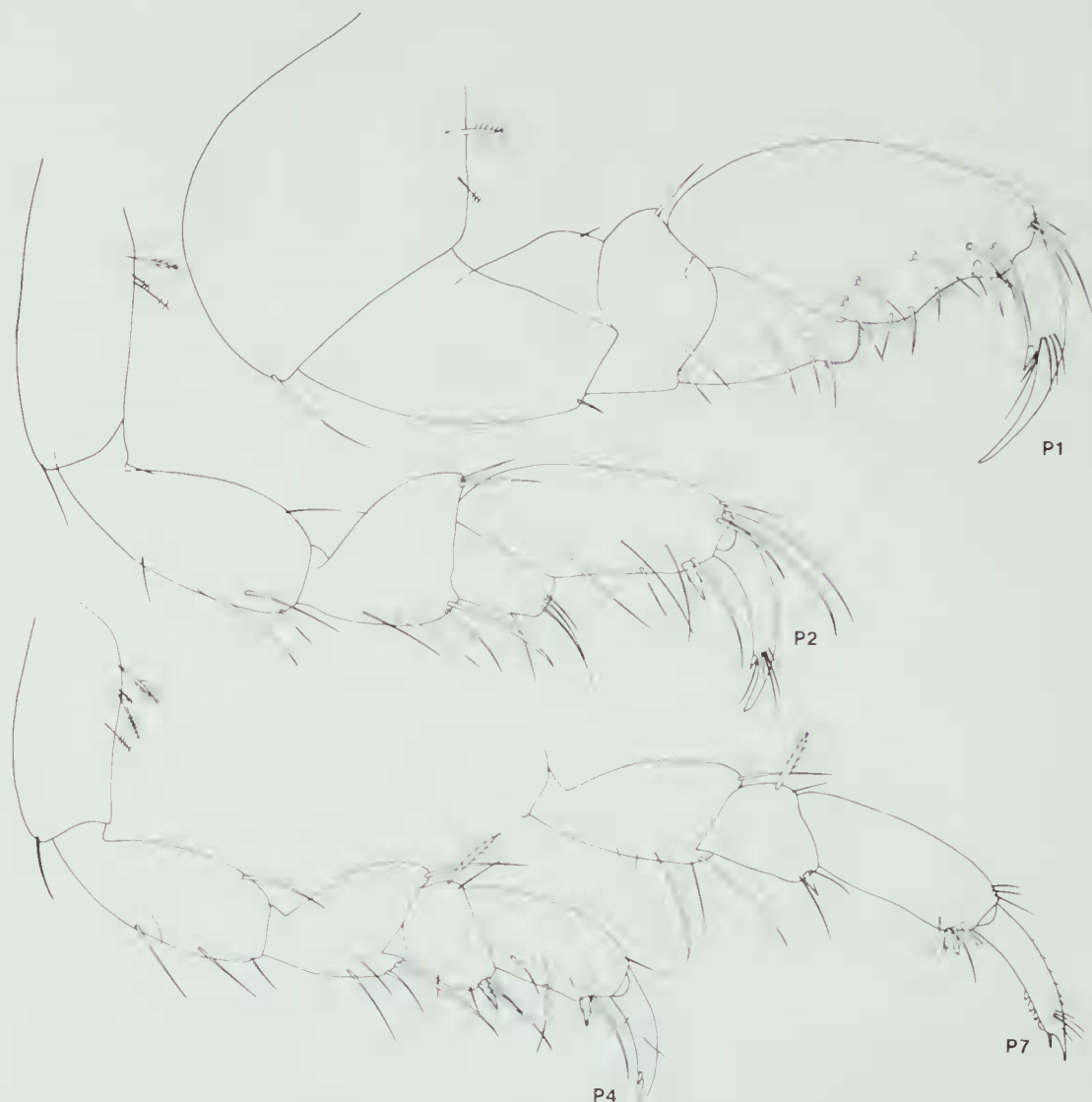


Figure 5. *Amakusanthura angophora*. Holotype juvenile.

terised by the upturned rim on the telson, a character shared with *A. brachyscome* (q.v.).

***Amakusanthura eugenia* sp. nov.**

Figures 11, 12

Material examined. 2 males, 27 juveniles; 5.8-13.4 mm.

Holotype. Juvenile, 13.4 mm, NMV J12320. Qld, Bowling Green Bay (19°14'S, 147°07'E), coarse silt, P. Arnold, 17 Jun 1975 (TBS stn).

Paratypes. Qld, Bowling Green Bay and Halifax Bay (TBS stns), NMV J12321(1), J12322(1), J12324-J12326(3),

J12330-J12332(3); AM P36776(2); QM W12168(1). NE of Townsville, NMV J12327-J12329(4), J12333(1).

Other material. Qld, Townsville bays (TBS stns), NMV J12323(1), J12343(submale, 11 mm), J12344(1), J12345(1). Triangular Is., Shoalwater Bay (22°23'S, 150°30'E), J. Lewis, 1981-1982, NMV J12334-J12339(6), J12340(male, 13 mm), J12341(1), J12342(1).

Diagnosis. Not pigmented. Pereopod 1 propodus anterior margin almost straight and strongly produced distally; palm axial, long, with step at midpoint. Pereopod 2 carpus with produced

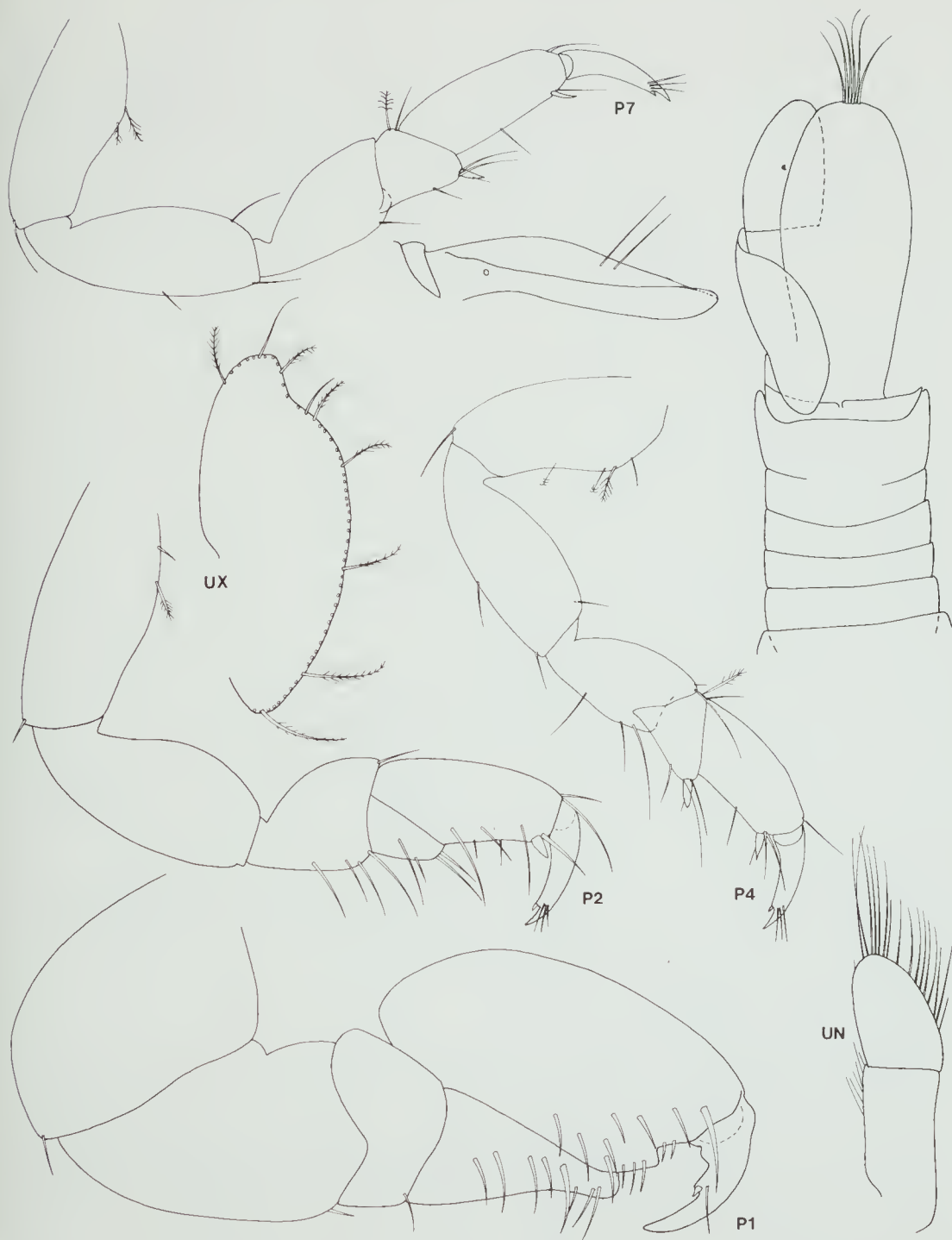


Figure 6. *Amakusanthura brachyscome*. Holotype juvenile.

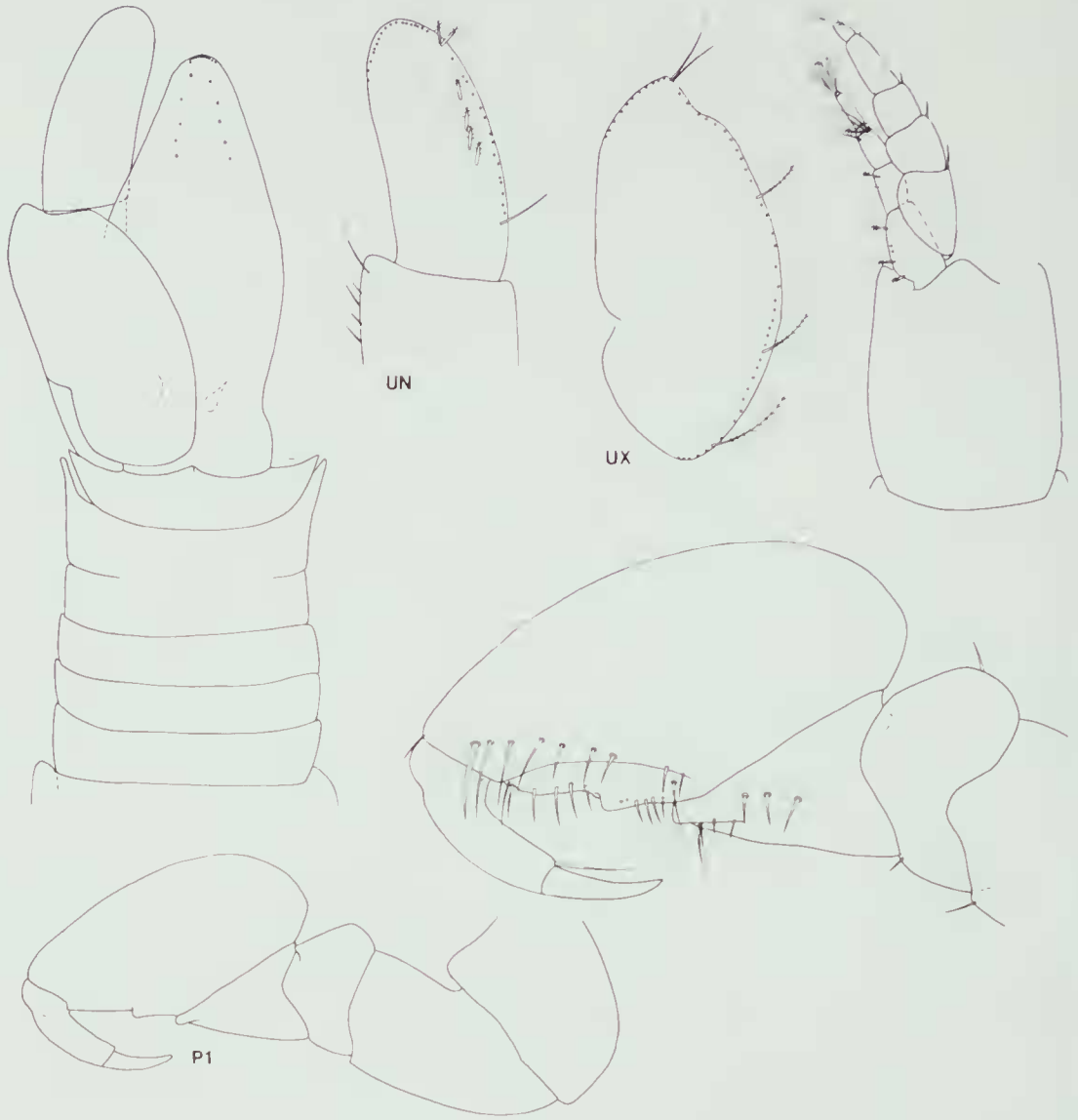


Figure 7. *Amakusanthura coppingeri*. Holotype juvenile.

posterodistal margin. Pleonites 1-4 separated by dorsal grooves. Uropodal endopod reaching to end of telson, triangular, almost twice as long as wide, apex and lateral margin evenly convex. Exopod twice as long as wide, with definite distoventral lobe, distal notch and convex dorsal margin. Telson dorsally flat, widest at midpoint and tapering to narrowly rounded apex, lateral margins evenly convex, with few dorsal setae. Male. Antenna 1

flagellum of 28 articles, reaching to end of pereonite 3. Head with small chin, large eyes and broad rostrum. Posterior pereopods more elongate than in juvenile, telson and uropods as in juvenile. With minute pair of penes.

Distribution. Central Queensland bays and shallow shelf; silty sediments.

Remarks. A very flat, simple telson and broad uro-

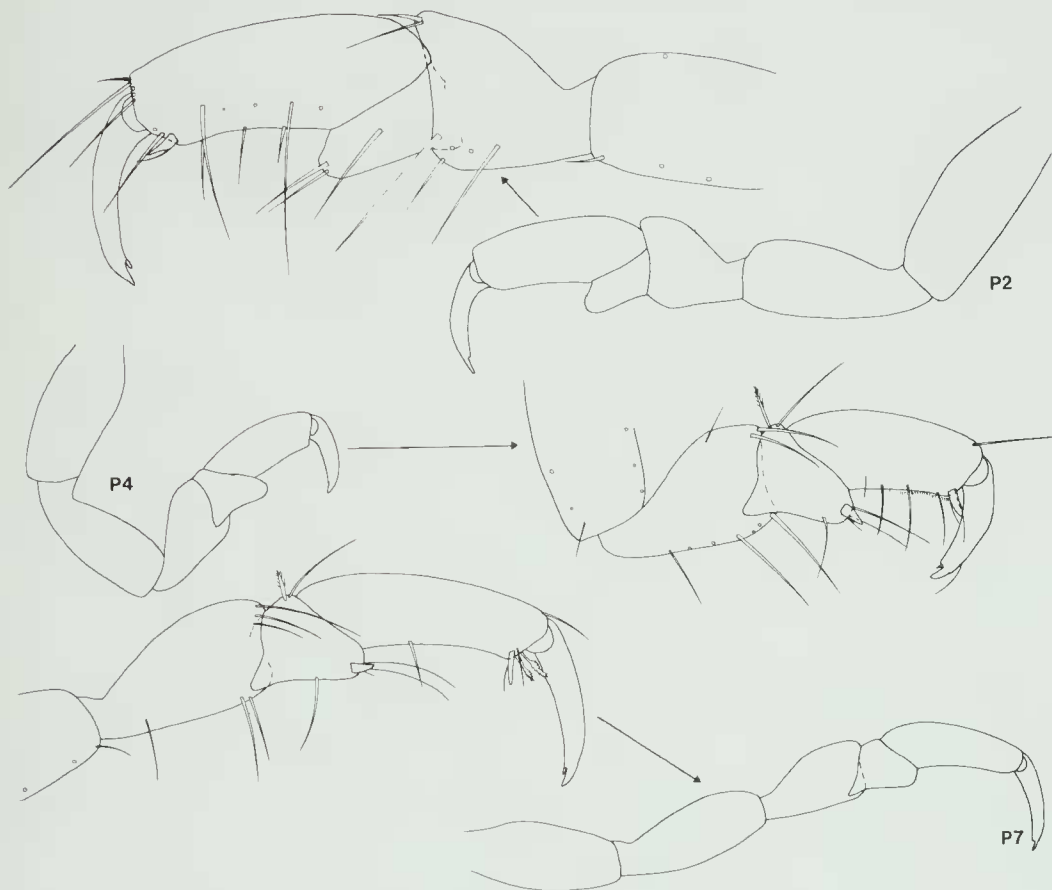


Figure 8. *Amakusanthura coppingeri*. Holotype juvenile.

podal exopod characterise this, one of the largest of all the tropical species of *Amakusanthura*.

***Amakusanthura goodenia* sp. nov.**

Figures 13, 14

Material examined. 1 submale, 10 juveniles; 4.4-7.2 mm.

Holotype. Juvenile, 6.8 mm, NMV J12350. Qld, Cleveland Bay (19°11'S, 146°56'E), 10 m, very fine sand, P. Arnold, 8 Oct 1975 (TBS stn).

Paratypes. Qld, Bowling Green Bay, Cleveland Bay and Halifax Bay, 3-10 m (TBS stns), NMV J12346-J12349(4), J12351(1), J12354(1), J12355(submale, 7.2 mm), J12356(1).

Diagnosis. Not pigmented. Pereopod 1 anterior margin gently curved, length twice greatest width; palm axial but abruptly stepped from carpus, with strong distal tooth. Pereopod 2 carpus with roundly lobed posterodistal margin. Pleonites 1-4 separated

by dorsal grooves. Uropodal endopod reaching well beyond telson, elongate, 1.8 times as long as wide, distolateral margin continuously convex. Exopod twice as long as wide, with an acute distoventral lobe separated from dorsal lobe by a shallow notch. Telson moderately domed, tapering abruptly beyond midpoint to a narrower apex, with few dorsal setae. Male. Only submale known. Antenna 1 flagellum of 15 articles reaching to midway along pereonite 3.

Distribution. Central Queensland bays, 3-10 m, fine sandy sediments.

Remarks. The distally narrowed telson distinguishes *Amakusanthura goodenia* from the others with which it co-occurs. A similar species with a narrowed telson, *A. wahlenbergia*, occurs in reef lagoonal environments but is separated by its smaller size, more elongate uropodal endopod,

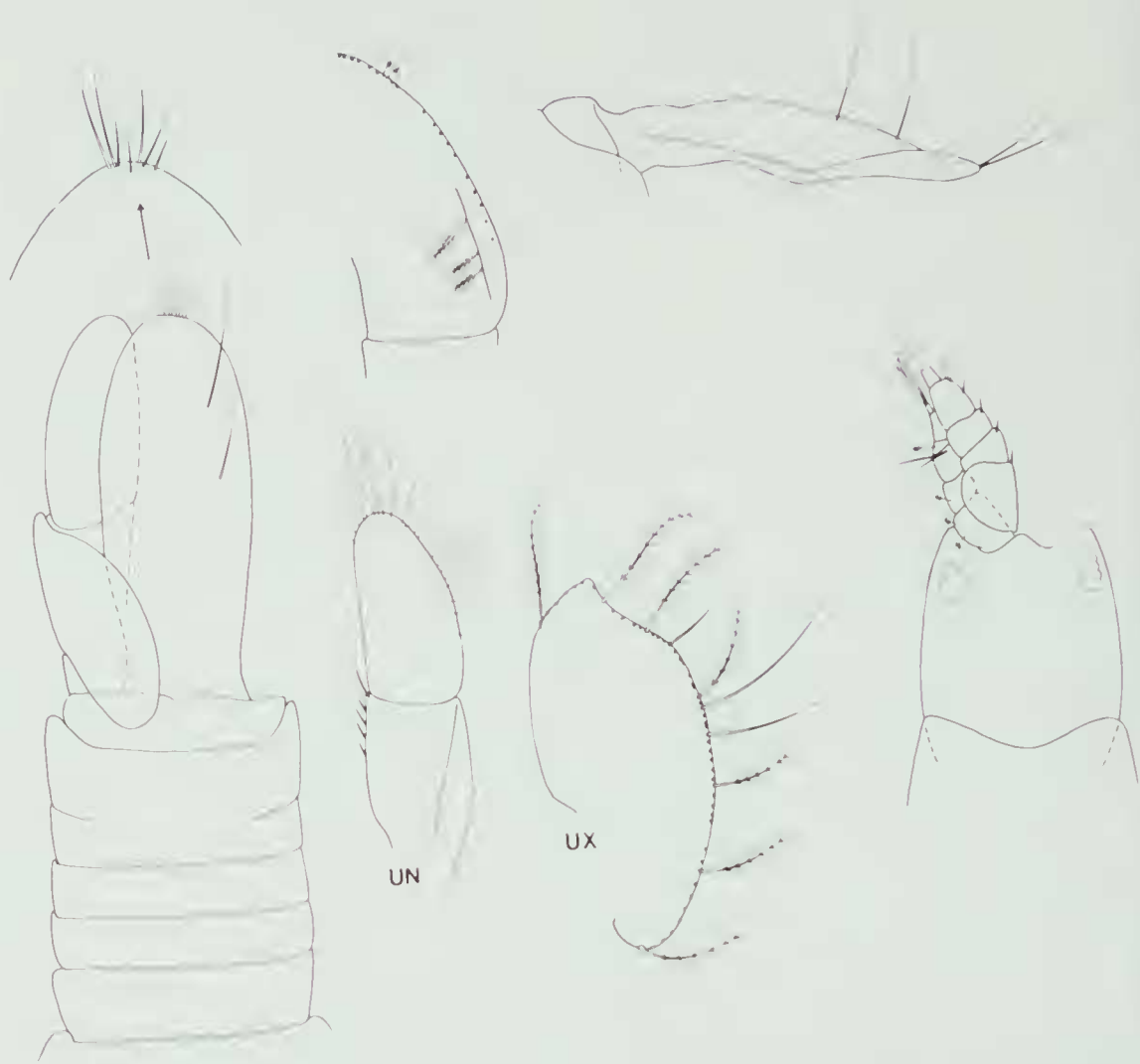


Figure 9. *Amakusanthura dodonaea*. Holotypejuvenile.

more acute telson and more rectangular propodi of pereopods 4-7.

***Amakusanthura hibbertia* sp. nov.**

Figures 15-17

Material examined. 2 submales, 62 juveniles; 5.3-15.2 mm.

Holotype. Juvenile, 11.1 mm, AM P29730 (with slide). Qld, Lizard Is. (14°40'S, 145°28'E), lagoon at south end of island, 4 m, A. Jones and C. Short, 11 Oct 1978.

Paratypes. Qld, Lizard Is., various localities: AM P29633(3), P29634(submale, 8.5 mm), P29635(2), P29636(3), P29639-P29641(4), P29643(3), P29649(1), P29650(1), P29666(23), P29696(1), P29698(1), P29699(1), P29731-P29733(3), P29737(1), P29739(1), P29990(1),

P36777(2); QM W12169(1); NMV J12357-J12361(5).

Other material. Qld, One Tree Is. (23°30'S, 152°05'E), C. Short and J. Young, Oct 1979, AM P29692(1), P29779(submale, 15.2 mm).

WA, North-west Shelf, 20°00'S, 117°00'E, 52 m, 4 Sep 1983 (CSIRO stn B17), NMV J12262(2); 19°57'S, 117°54'E, 43 m, 26 Aug 1983 (CSIRO stn B2), NMV J12363(1).

Diagnosis. Dorsally pigmented brown. Pereopod 1 carpus anterior margin gently curved, length 2.1 times greatest width; palm stepped away from carpus, more or less axial, with a strong proximal tooth. Pereopod 2 carpus with strongly and broadly lobed posterdistal margin. Pereopods 2-7 all with broad setose distal articles. Pleonites 1-4 separated

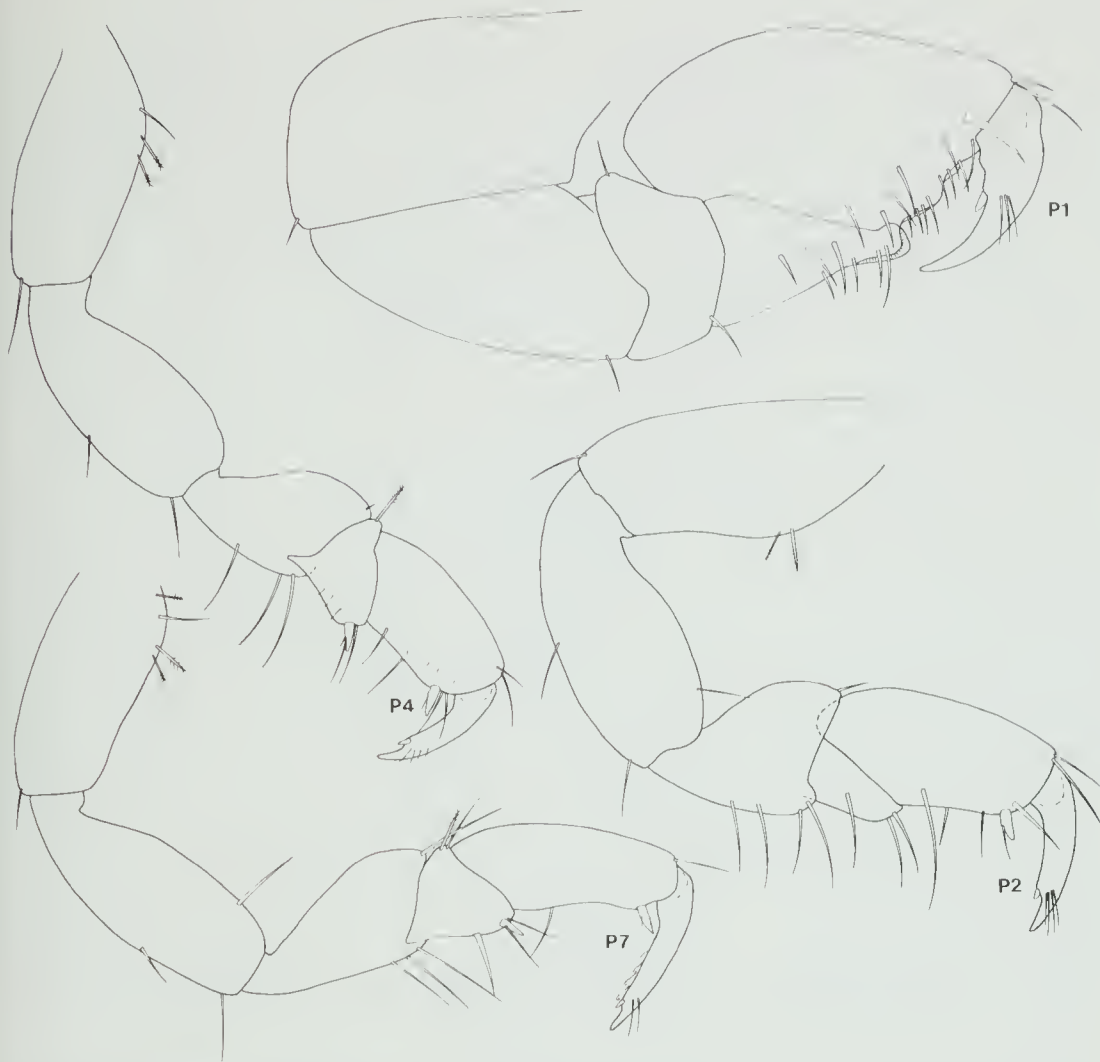


Figure 10. *Amakusanthura dodonaea*. Holotype juvenile.

by dorsal grooves. Uropodal endopod barely exceeding telson, triangular, 1.6 times as long as wide, distolateral margin evenly convex. Exopod 2.2 times as long as wide, with prominent acute distoventral lobe separated from dorsal lobe by a strong notch. Telson strongly and broadly domed, tapering to a broadly rounded apex, with 3 pairs of setae.

Male. Submale only known. Antenna 1 flagellum of 30 articles reaching to posterior margin of pereonite 2. Telson with a mid-dorsal depression. Pereopods more elongate and less setose than in juvenile.

Distribution. Great Barrier Reef island lagoonal sediments; North-west Shelf, 43-52 m.

Remarks. In many ways *Amakusanthura hibbertia* resembles some species of *Apanthura*, especially those of species-group 2 (Poore and Lew Ton, 1985). This is the only *Amakusanthura* with lobed and richly setose pereopods but the pleonal dorsal grooves and long male antennal flagellum confirm its generic placement. The long antennal setae are also a feature of the species. The species is one of the largest from reef lagoonal habitats and can be distinguished from *A. pandorea* by the pereopodal setae and strongly domed telson.

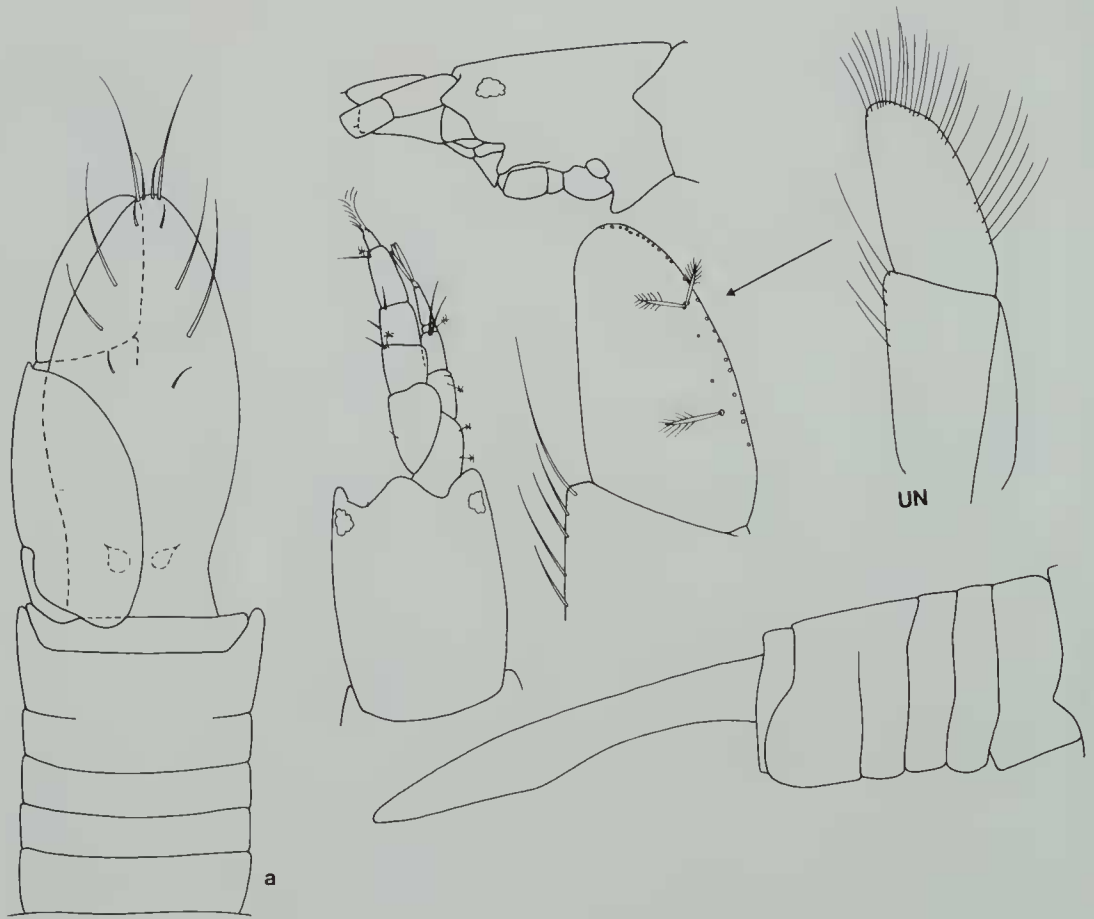


Figure 11. *Amakusanthura eugenia*. Holotype juvenile; a, paratype juvenile, 9.4 mm, NMV J12329.

The specimens from the North-west Shelf differ from those from north-eastern Australia in having a more acutely tapering telson a more definitely notched uropodal exopod.

Amakusanthura kingia sp. nov.

Figures 18, 19

Material examined. 2 males, 14 juveniles; 4.4-6.9 mm.

Holotype. Juvenile, 5.9 mm, NMV J12369. Qld, Townsville bays area (19°S, 147°E), P. Arnold, 1974-1977 (TBS stn).

Paratypes. Qld, NE of Townsville, various localities, 23-24 m, muddy sand, G.C.B. Poore and H.M. Lew Ton, 24 Nov 1982, NMV J12370(2), J12371(3), J12379(1). Triangular Is., Shoalwater Bay (22°23'S, 150°31'E), various localities, intertidal mudflats, J. Lewis, 1978-1982, NMV J12372-J12381(7 + 2 males, 5.7 mm).

Diagnosis. Not pigmented. Pereopod 1 propodus anterior margin gently curved, length twice greatest width; palm axial, slightly convex, without tooth. Pereopod 2 carpus with roundly angled posterodistal margin. Pleonites 1-4 separated by dorsal grooves. Uropodal endopod as long as telson, elongate, curved, almost twice as long as wide, lateral margin without setae along the middle of its length. Exopod 2.4 times as long as wide, distoventral lobe broad, dorsal margin sinuous. Telson slightly domed, tapering most strongly in distal third, apically thin and slightly upturned, with irregularly arranged dorsal setae.

Male. Antenna 1 flagellum of 13 articles reaching to end of pereonite 2. Pleon elongated, uropodal endopod elongated beyond telson. Telson with a mid-dorsal depression.

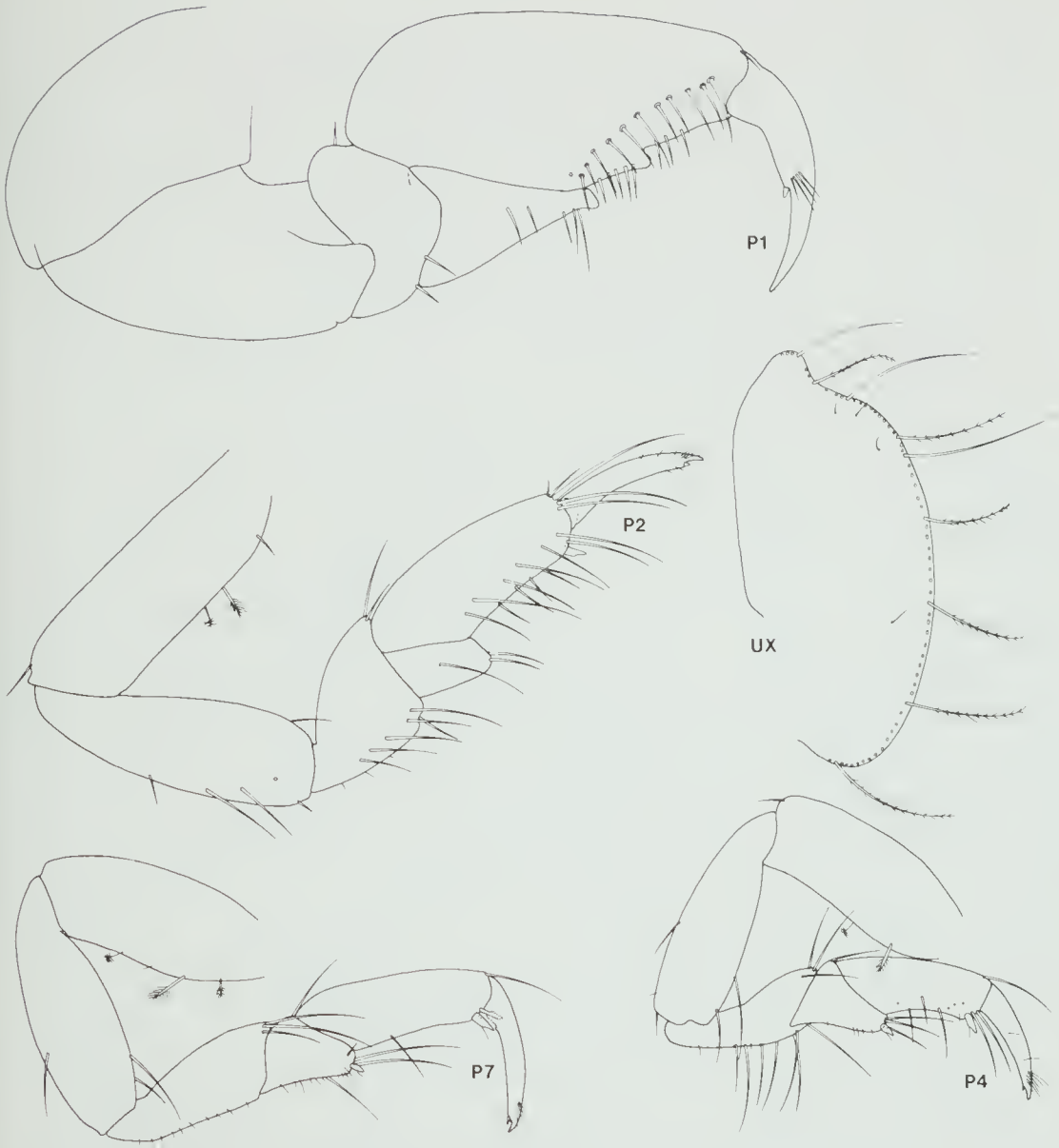


Figure 12. *Amakusanthura eugenia*. Holotype juvenile.

Distribution. Central Queensland, bays and shelf, sedimentary environments, intertidal-24 m.

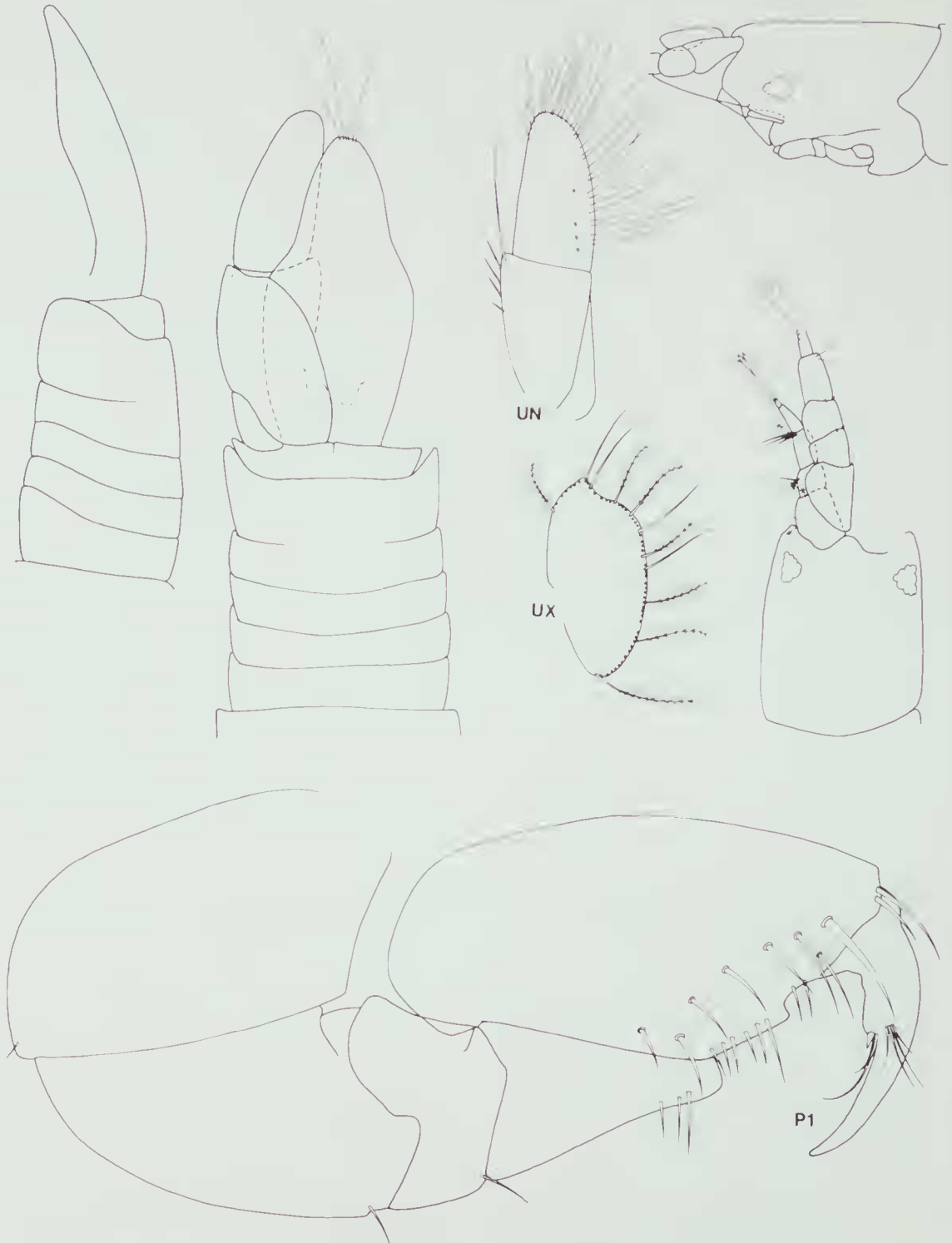
Remarks. *Amakusanthura kingia* is a small species best recognised by its narrow uropodal exopod and the gap in the setal row on the endopod.

***Amakusanthura lechenaultia* sp. nov.**

Figures 20, 21

Material examined. 3 juveniles; 4.3-8.7 mm.

Holotype. Juvenile, 8.7 mm, NMV J12380. Qld, Bowling Green Bay (19° 18'S, 147° 07'E), coarse silt, P. Arnold, 13 Mar 1975 (TBS stn).



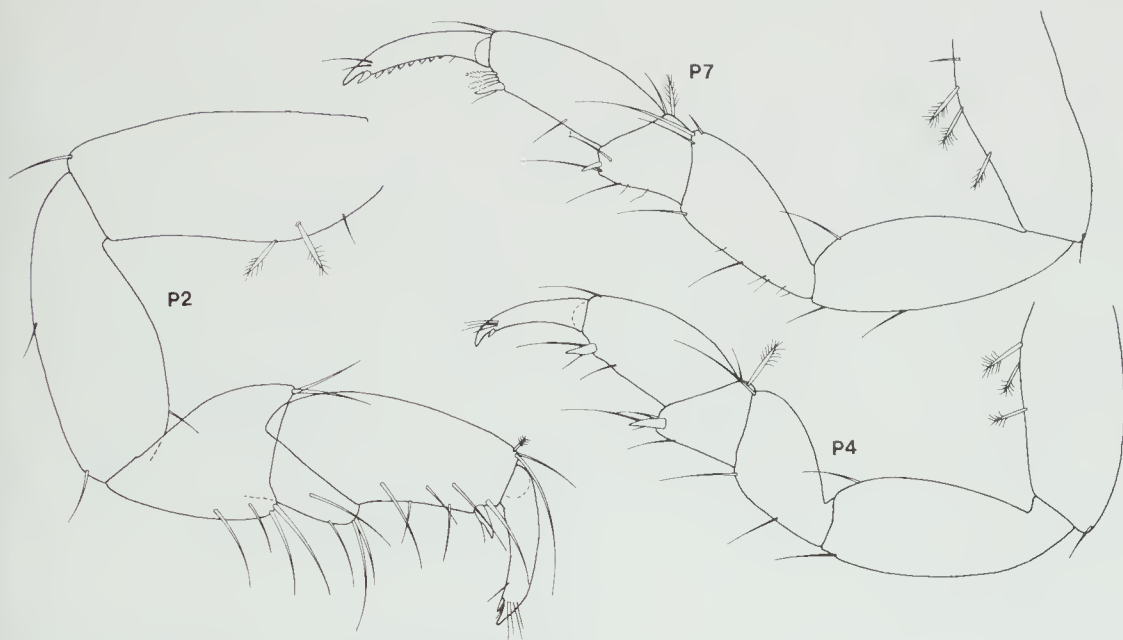


Figure 14. *Amakusanthura goodenia*. Holotype juvenile.

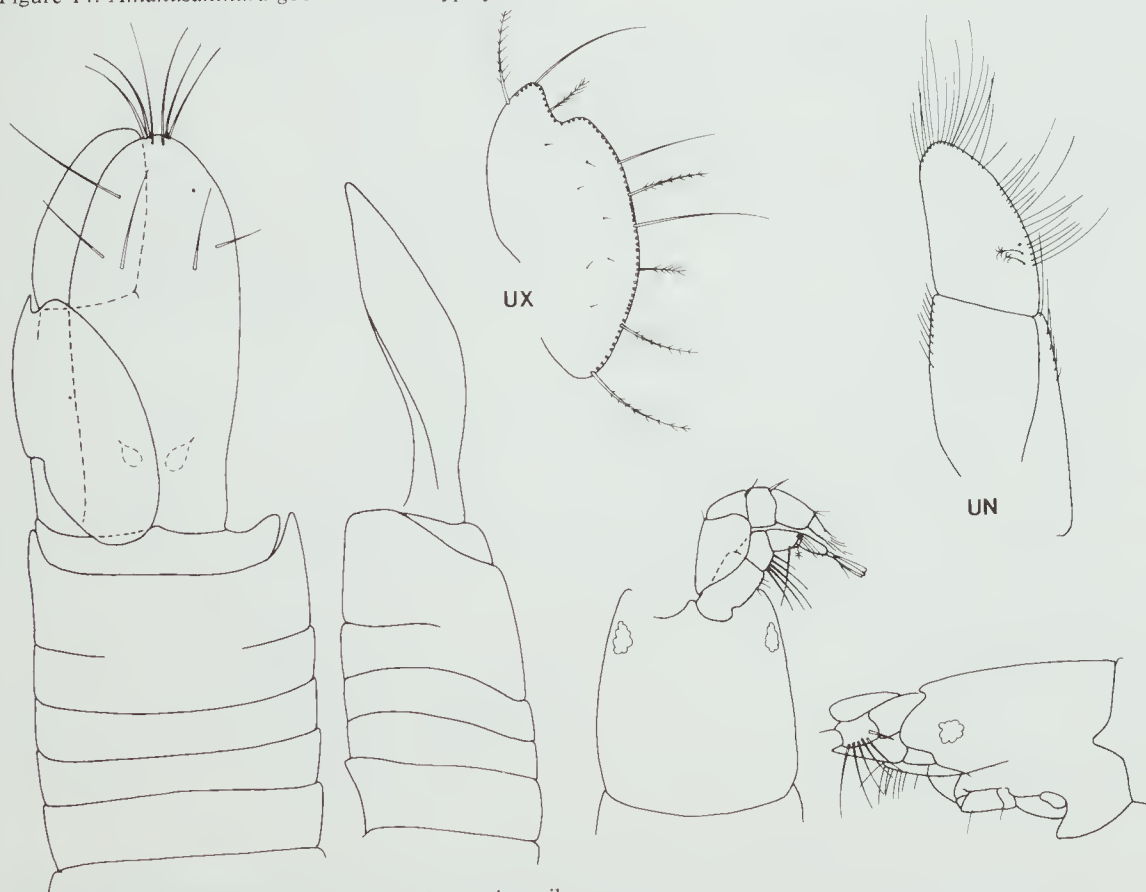


Figure 15. *Amakusanthura hibbertia*. Holotype juvenile.



Figure 16. *Amakusanthura hibbertia*. Holotype juvenile; a, paratype submale, 8.5 mm, AM P29639.

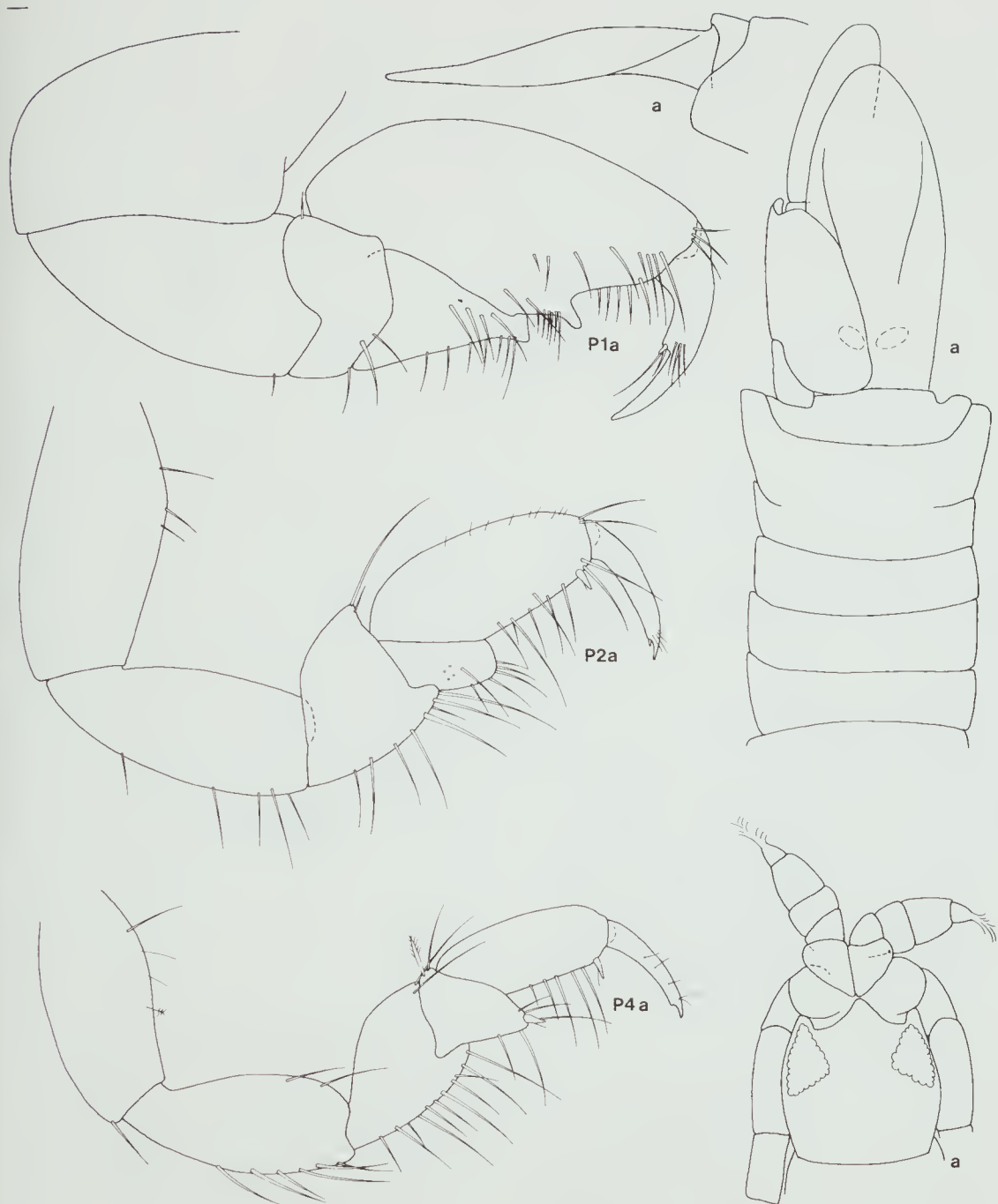


Figure 17. *Amakusanthura hibbertia*. a, paratype submale, 8.5 mm, AM P29639.



Figure 18. *Amakusanthura kingia*. Holotype juvenile.



Figure 19. *Amakusanthura kingia*. Holotype juvenile.

Paratypes. Qld, Halifax Bay (TBS stns), NMV J12381(1), J12382(1).

Diagnosis. Not pigmented. Pereopod 1 propodus anterior margin straight over most of its length and parallel to carpal suture; palm axial but stepped from carpus, with a concavity at the mid-point, without tooth. Pereopod 2 carpus with slightly lobed posterodistal margin. Pleonites 1-4 separated by dorsal grooves. Uropodal endopod not reaching end of telson, elongate, twice as long as wide, lateral margin convex. Exopod 2.4 times as long as wide, with acute distoventral lobe, shallow dorsal notch and convex dorsal margin. Telson moderately domed anteriorly, especially elongate, evenly curved lateral margins tapering to acute apex, with few dorsal setae.

Male. Unknown.

Distribution. Central Queensland bays; sedimentary environments.

Remarks. These three individuals could not be reconciled with any of the other species from the area and, because of their especially elongate telson, represent a separate species. The species is most similar to *A. correa* (Poore and Lew Ton) from Moreton Bay, southern Queensland from which it differs in more elongate telson and uropodal exopods.

Amakusanthura melaleuca sp. nov.

Figure 22

Material examined. 5 juveniles; 4.0-7.6 mm.

Holotype. Juvenile, 7.6 mm, NMV J12383. Qld, Halifax Bay (19°05'S, 146°48'E), 12 m, very fine sand, P. Arnold, 26 Feb 1976 (TBS stn).

Paratypes. Qld, Bowling Green Bay and Halifax Bay (TBS stns), NMV J12384(1), J12385(1), J12387(1).

Other material. Qld, Triangular Is., Shoalwater Bay, intertidal mudflat, NMV J12386(1).

Diagnosis. Not pigmented. Pereopod 1 propodus anterior margin gently curved, length twice greatest width; palm oblique, with a blunt step at midpoint. Pereopod 2 carpus with roundly lobed posterodistal margin. Pleonites 1-4 separated by dorsal grooves. Uropodal endopod exceeding telson by almost one-third its length, elongate, twice as long as wide, lateral margin only weakly convex, apex acutely rounded. Exopod 1.8 times as long as wide, with acute distoventral lobe separated from broad dorsal lobe by angled notch. Telson slightly domed, tapering to truncate apex, lateral margins thin, convex, with few dorsal setae.

Male. Unknown.

Distribution. Central Queensland, bays, intertidal—shallow subtidal sediments.

Remarks. *Amakusanthura melaleuca* differs from all other species in the possession of especially elongate uropodal endopods well exceeding the telson. It is most similar to *A. pimelia* (Poore and Lew Ton) from Moreton Bay and northern New South Wales.



Figure 20. *Amakusanthura lechenaultia*. Holotype juvenile.

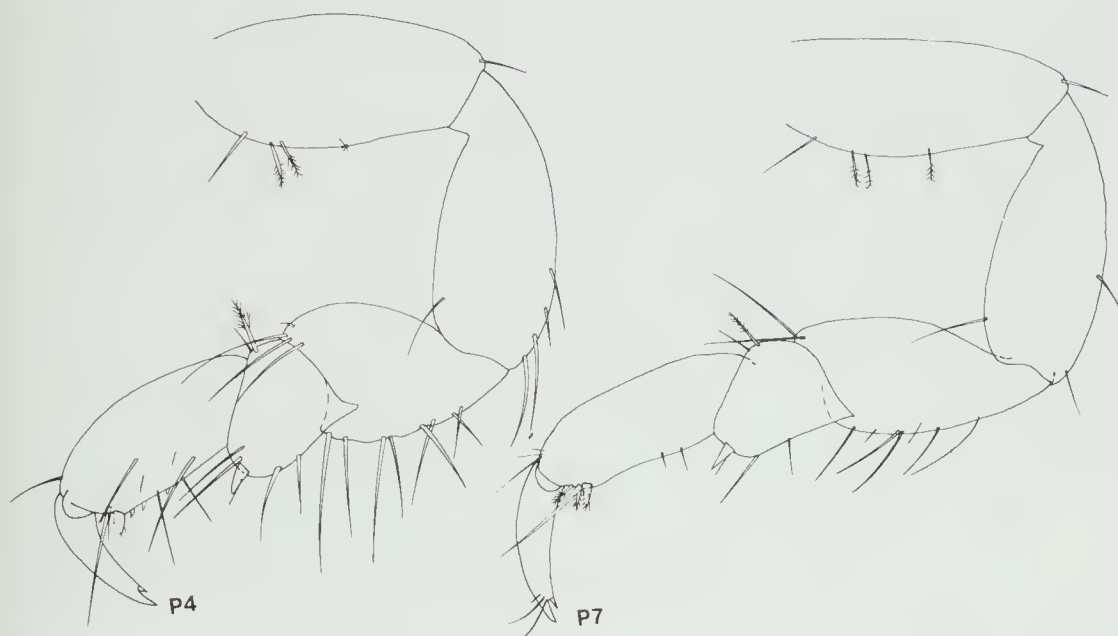


Figure 21. *Amakusanthura lechenaultia*. Holotype juvenile.

***Amakusanthura pandorea* sp. nov.**

Figures 23, 24

Material examined. 5 juveniles; to 14.0 mm.

Holotype. Juvenile, 14.0 mm, NMV J12388. Qld, Halifax Bay (19°05'S, 146°45'E), 12 m, very fine sand, P. Arnold, 26 Feb 1976.

Paratypes. Qld, type locality, NMV J12390(2). Townsville bays (TBS stns), NMV J12389(1), J12391(1).

Diagnosis. Not pigmented. Pereopod 1 propodus anterior margin gently curved, length twice greatest width; palm axial and stepped away from carpus, long, with strong step at midpoint. Pereopod 2 carpus with angled posterodistal margin. Pleonites 1-4 separated by dorsal grooves. Uropodal endopod reaching as far as telson, triangular, little longer than wide, lateral margin and apex continuously convex. Exopod twice as long as wide, disoventral lobe rounded, separated from convex dorsal lobe by shallow notch. Telson only slightly domed, distal third tapering to broad apex, disolateral margins straight, with numerous dorsal setae distally.

Male. Unknown.

Distribution. Central Queensland, bays, shallow subtidal sediments.

Remarks. *Amakusanthura pandorea* differs from *A. agonis*, another large species from the Townsville region, in its flattened telson and pleonal grooves. The species may key with *A. hibbertia* but lacks the dense pereopodal setae of this species.

***Amakusanthura tristania* sp. nov.**

Figures 25, 26

Material examined. 1 submale, 28 juveniles; 2.6-6.2 mm.

Holotype. Juvenile, 6.2 mm, AM P29803(with slide). Qld, Lizard Is. (14°40'S, 145°28'E), eastern end of Mangrove Beach, 2 m, sand, A. Jones, 10 Oct 1978.

Paratypes. Qld, Lizard Is., various localities: AM P29637(1), P29638(1), P29642(2), P29648(1), P29661(1), P29662(1), P29671(1), P29697(1), P29700(1), P29729(1), P29738(1), P29741(1), P29800(1), P29989(1), P36778(2 + submale, 4.5 mm); QM W12170(6); NMV J12401-2(2), J12404(1). Britomart Reef (18°17'S, 146°38'E), NMV J12402(1).

Diagnosis. Not pigmented. Pereopod 1 propodus anterior margin strongly curved, length twice greatest width; palm short, oblique, stepped away

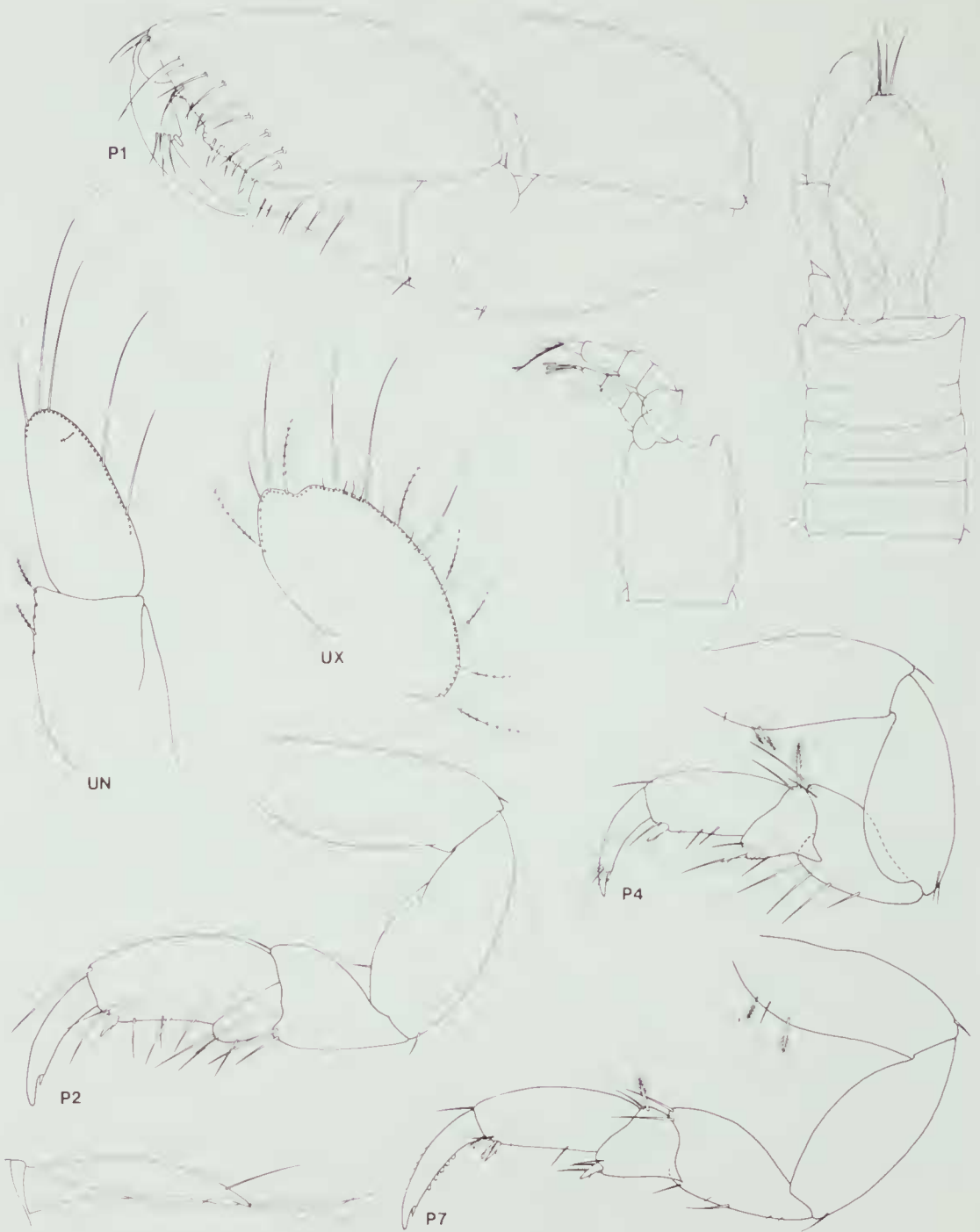


Figure 22. *Amakusanthura melaleuca*. Holotype juvenile.



Figure 23. *Amakusanthura pandorea*. Holotype juvenile.

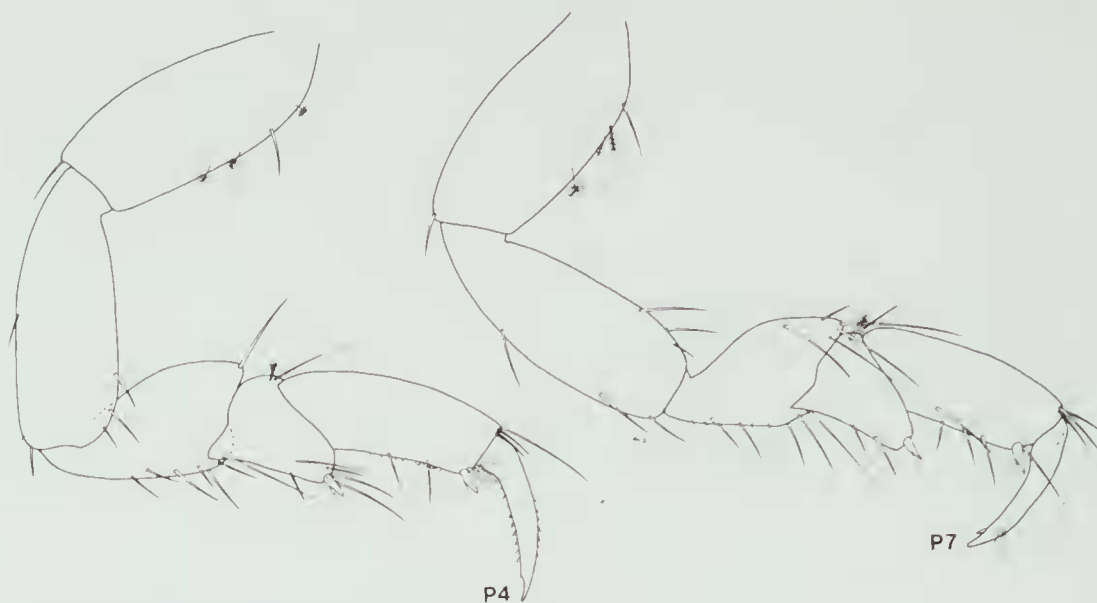


Figure 24. *Amakusanthura pandorea*. Holotype juvenile.

from carpus, with blunt tooth at midpoint. Pereopod 2 carpus with bluntly lobed posterodistal margin. Pleonites 1-4 separated by dorsal grooves. Uropodal endopod exceeding telson slightly, subtriangular, 1.8 times as long as wide, lateral margin convex. Exopod 2.1 times as long as wide, distoventral lobe broad, dorsal margin evenly convex. Telson slightly domed, almost parallel-sided proximally and tapering only gradually to broad apex, with few dorsal setae.

Male. Submale only known. Antenna 1 flagellum of 14 articles, reaching to end of pereonite 2.

Distribution. North and central Great Barrier Reef, lagoonal sediments.

Remarks. *Amakusanthura tristania* is a small species characterised by a broadly rounded telson and broad uropodal exopod. The existence of a very small male with these features confirms that these specimens are not juveniles of another reef species.

Amakusanthura wahlenbergia sp. nov.

Figures 27, 28

Material examined. 1 submale, 10 juveniles; 3.6-6.9 mm.

Holotype. Juvenile, 6.9 mm, AM P29678 (with slide). Qld, Lizard Is. (14°40'S, 145°28'E), 100 m off Chinamans Ridge, Mrs Watsons Bay, 9 m, A. Jones and C. Short, 13 Oct 1978.

Paratypes. Qld, Lizard Is., various localities: AM P29652(1), P29665(1), P29673(2), P29675(1), P29677(1), P29679(1), P29680(1), P29683(1), P29694(1 submale, 6.3 mm).

Diagnosis. Not pigmented. Pereopod 1 propodus broadening distally, length 2.3 times greatest width; palm axial, stepped away from carpus, with blunt tooth. Pereopod 2 carpus with barely lobed posterodistal margin. Pleonites 1-4 separated by dorsal grooves. Uropodal endopod just exceeding telson, elongate, twice as long as wide, apex broadly rounded. Exopod twice as long as wide, distoventral lobe acute, small, separated by notch from extensive convex dorsal lobe. Telson only slightly domed, distinct lateral flanges proximal to concave distolateral margins, apex acute, with few dorsal setae.

Male. Submale only known. Antenna 1 flagellum of 19 articles reaching as far as middle of pereonite 3.

Distribution. Northern Great Barrier Reef, lagoonal sediments.

Remarks. The distinctive lateral flanges and acute apex on the telson of *Amakusanthura wahlenbergia* distinguish it from other reef species. Its small size, particularly of the male, and narrower uropodal endopod differentiate the species from *A. goodenia* which has a similar telson but comes from shelf habitats.

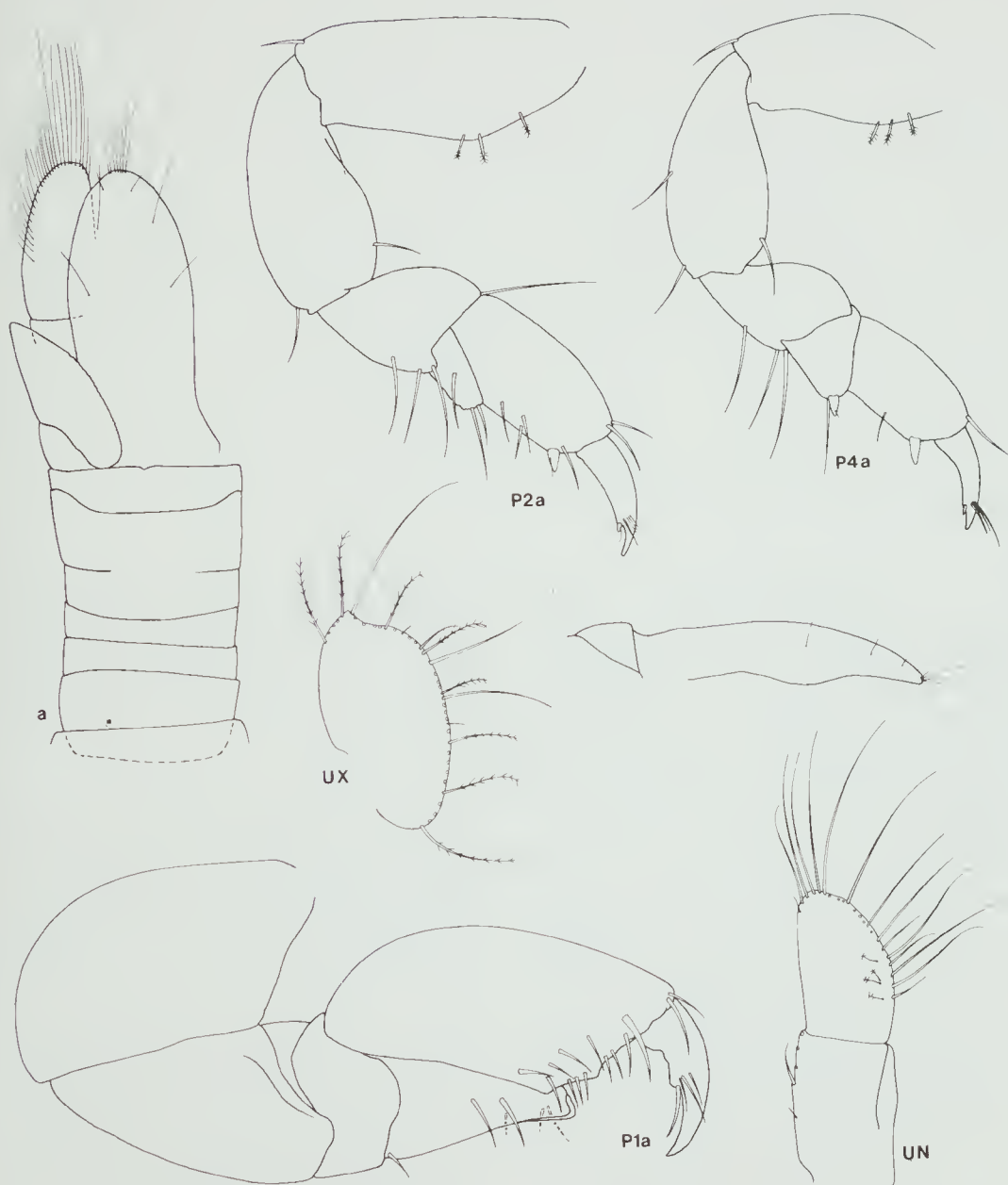


Figure 25. *Amakusanthura tristania*. Holotype juvenile.

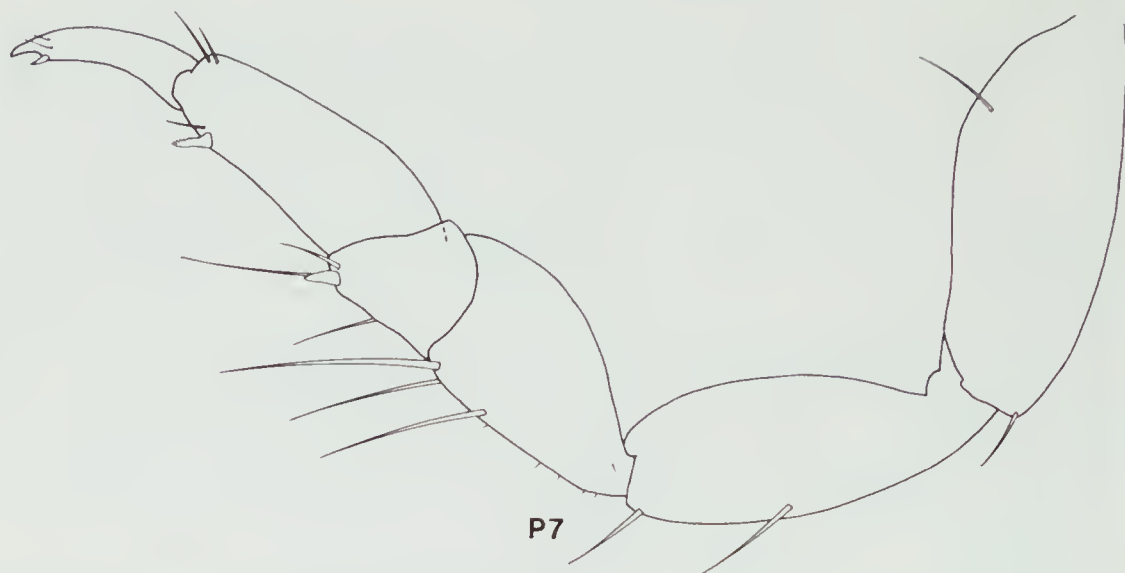


Figure 26. *Amakusanthura tristania*. Holotype juvenile.

Apanthura Stebbing

Remarks. *Apanthura* was recently diagnosed by us and differentiated from *Apanthuretta* (= *Amakusanthura*) (Poore and Lew Ton, 1985). The most reliable character differentiating it from *Amakusanthura* is the much shorter male antenna 1 flagellum (fewer than 10 articles) but the absence of grooves between pleonites is also useful. Males of *Apanthura* are far more modified than those of *Amakusanthura*, especially in the anterior pereopods.

In 1985 we divided the nine south-eastern Australian species of *Apanthura* into two species-groups. The tropical species described here cannot all be clearly assigned and may represent new groupings. *Apanthura restio* and *A. stipa* are small pigmented species whose males have only slightly modified limbs, differing in many ways from species from temperate environments. *Apanthura pultenaea* has attributes of both the groups already recognised but males are unknown.

Apanthura kennedia sp. nov.

Figures 29, 30

Material examined. 11 juveniles; 2.0-6.6 mm.

Holotype. Juvenile, 6.6 mm, AM P29801. Qld, Lizard Is. (14°40'S, 145°28'E), fringing reef between Bird Islet and South Is., coral rubble from reef base, 21 m, A. Jones, 7 Oct 1978.

Paratypes. Qld, NE of Townsville, muddy sand, G.C.B. Poore and H.M. Lew Ton, 24 Nov 1982: 19°03'S, 146°52'E, 23 m, NMV J12364(1); 18°24'S, 146°39'E, 45 m, NMV J12365(1). One Tree Is. (23°30'S, 152°05'E), various localities: AM P29676(1), P29780(1), P29781(1), P29782(2).

Other material. Qld, Townsville bays (TBS stns), NMV J12366-J12368(3).

Diagnosis. Not pigmented. Antenna 1 peduncle with 1 seta each on articles 2 and 3. Pereopod 1 carpus with blunt tooth; propodus palm nearly axial, with strong step, with about 7 mesial setae. Pereopod 2 merus without posterior lobe; carpus with subacutely lobed posterodistal margin; propodus rectangular. Pereopods 4-7 with only few posterior setae on merus and carpus. Uropod exceeding apex of telson; endopod with continuous row of setae along lateral and distal margin, twice as long as greatest width. Exopod 1.5 times as long as greatest width, ventrodistal lobe and apex of dorsal lobe equal, separated by a deep notch. Telson 1.5 times as long as pleon, 2.2 times as long as greatest width, lateral margins evenly convex, apex roundly acute, flat, 2 pairs of dorsal setae at distal third.

Male. Unknown.

Distribution. Great Barrier Reef islands and central Queensland bays, sedimentary habitats.

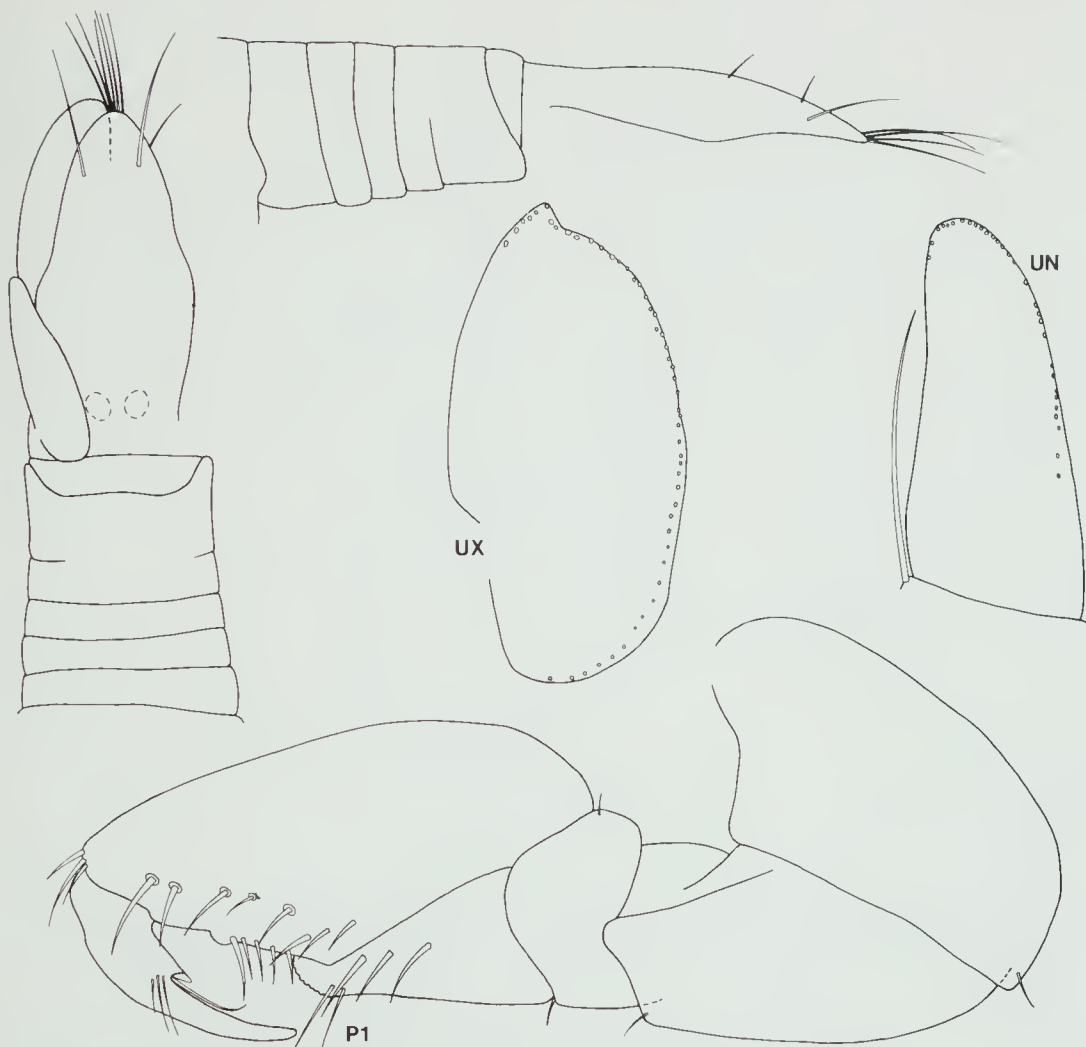


Figure 27. *Amakusanthura wahlenbergia*. Holotype juvenile.

Remarks. *Apanthura kennedia* is the only tropical species which can easily assigned to one of the two *Apanthura* species-groups (Poore and Lew Ton, 1985). It closely resembles *A. drosera* Poore and Lew Ton from deep sediments in Bass Strait. Both belong to *Apanthura* species-group 1. The new species may be separated on the basis of its more elongate telson, different uropodal exopod and shorter pereopod 1 palm.

In the material from Townsville bays the palm of pereopod 1 is more elongated than typical and bears a prominent tooth.

Apanthura pultenaea sp. nov.

Figures 31, 32

Material examined. 10 juveniles; 4.4-7.7 mm.

Holotype. Juvenile, 7.4 mm, NMV J12392 (with slide). Qld, Halifax Bay (19°01'S, 146°34'E), 11 m, coarse silt, P. Arnold, 23 Nov 1976 (TBS stn).

Paratypes. Qld, Townsville bays (TBS stns), NMV J12393(1), J12397(1). NE of Townsville, muddy sand, 24-34 m, G.C.B. Poore and H.M. Lew Ton, 24 Nov 1982, NMV J12394(2), J12395(1), J12396(1).

Other material. WA, North-west Shelf (20°20'S, 115°58'E), 42 m, G.C.B. Poore and H.M. Lew Ton, 9



Figure 28. *Amakusanthura wahlenbergia*. Holotype juvenile.

Jun 1983, NMV J12398(1); 19°05'S, 118°58'E, 82 m, 23 Oct 83 (CSIRO stn B10), NMV J12399(1); 19°29'S, 118°52'E, 39 m, 25 Oct 1983 (CSIRO stn D3), NMV J12400(1).

Diagnosis. Not pigmented. Antenna 1 peduncle with 2-4 long lateral setae on articles 1 and 2. Pereopod 1 carpus with acute tooth; propodus palm axial, with strong tooth, with about 10 mesial setae. Pereopod 2 merus with slight posterior lobe; carpus with roundly lobed posterdistal margin; propodus rectangular. Pereopods 4-7 only moderately setose on articles 4 and 5. Uropod exceeding apex of telson; endopod with more or less continuous row of setae along distolateral margin, twice as long as greatest width. Exopod 1.7 times as long as wide, ventrodistal lobe acute, separated by distinct notch from broad dorsal lobe. Telson 1.2 times as long as pleon, twice as long as greatest width, lateral margins strongly convex at midpoint, tapering to an acute apex, flat, with few setae on distal third.

Male. Unknown.

Distribution. Central Queensland, bays and shelf, 11-34 m; North-west Shelf, 39-82 m.

Remarks. *Apanthura pultenaea* is best recognised by its acute telson in which it resembles the south-eastern species, *A. isotoma* Poore and Lew Ton. It differs from this species in not possessing those features which characterise *Apanthura* species-group 2. That is, *Apanthura pultenaea* has fewer antennal setae than is typical of this group, fewer pereopodal setae and has a continuous uropodal endopod setal row. In general, the species is more like members of species-group 1 but does not have the characteristic antennal setation.

Three small specimens from the North-west Shelf are assigned to this species but have a more elongate uropodal endopod and broader exopod than is typical (Fig. 31, a). They may represent a distinct species but until a range of material from across the north coast of Australia is available intraspecific variation cannot be determined.

***Apanthura restio* sp. nov.**

Figures 33, 34

Material examined. 5 males, 41 juveniles; 2.2-7.0 mm. Holotype. Juvenile, 6.8 mm, QM W12153(with slide).



Figure 29. *Apanthura kennedia*. Holotype juvenile.



Figure 30. *Apanthura kennedia*. Holotype juvenile.

Coral Sea Territory, Bennett Is., Chesterfield Reefs (19°55'S, 158°23'E), north end of lagoon, 1 m, N.L. Bruce, 8 May 1979.

Paratypes. Coral Sea Territory, Bennett Is., 12 m, N.L. Bruce, 6 May 1979, QM W12157(1); Long Is., Chesterfield Reefs (19°52'S, 158°19'E), 1-12 m, N.L. Bruce, May 1979, QM W12155(with slide, male, 7.0 mm), W12154(1), W12156(1).

Qld, Britomart Reef (18°17'S, 146°38'E), various localities: coral rubble, 5-15 m, G.C.B. Poore and H.M. Lew Ton, Nov 1982, NMV J12415(male, 5.0 mm), J12416(1), J12417(1 + male, 5.5 mm), J12419 (1), J12420(1), J12423(1). Fantome Is. (18°40'S, 146°31'E), coral rubble, 5-9 m, G.C.B. Poore and H.M. Lew Ton, Dec 1982, NMV J12413(with slide, male, 4.7 mm), J12414(13), J12421-2(6). Orpheus Is. (18°37'S, 146°29'E), coral rubble, 9 m, G.C.B. Poore and H.M. Lew Ton, Dec 1982, NMV J12424(3)

Other material. Qld, Lizard Is. (14°145'S, 145°28'E), B. Kensley, 28 May 1980, NMV J12428(male). Townsville bays (TBS stns), NMV collections(5). NE of Townsville, NMV J12430(1). Heron Is. (23°27'S, 151°55'E), QM W12158(3).

NT, McCluer Is. (11°06'S, 133°00'E), NMV 12425(1). Oxley Is. (11°00'S, 132°49'E), NTM Cr4066(1).

Diagnosis. Head, some pereonites and pleon with faint brown anastomosing dorsal pigment pattern. Antenna 1 peduncle with 1 seta on article 3. Pereopod 1 carpus with strong acute tooth; propodus palm axial, with tooth, with 7 mesial setae. Pereopod 2 merus with straight posterior margin; carpus with barely angled posterodistal margin; propodus

rectangular. Pereopods 4-7 with very few posterior setae on merus and carpus. Uropodal endopod with continuous row of setae along lateral and distal margin; 1.4 times as long as greatest width. Exopod twice as long as wide, ventrodistal lobe acute, dorsal lobe shorter and separated by deep notch. Telson 1.4 times as long as pleon, twice as long as greatest width, lateral margins evenly convex, tapering to faintly truncate margin, flat, with transverse row of long setae at three-quarter mark.

Male. Antenna 1 flagellum of 7 articles reaching to middle of pereonite 1. Head with small chin (as in juvenile). Pereopod 1 barely modified. Pleon slightly elongated.

Distribution. Coral Sea islands, Great Barrier Reef, northern Australian shelf; 1-15 m.

Remarks. This small slightly coloured species is most easily distinguished by the transverse setal row on the telson. The species is widespread in the tropics. Although juveniles from different habitats or regions could not be differentiated males from some localities were larger than others. The species shows most of the characteristics of species-group 1 but male pereopods are barely modified.

Apanthura stipa sp. nov.

Figures 35, 36

Material examined. 4 males, 87 juveniles; 2.6-5.4 mm. Holotype. Juvenile, 4.2 mm, QM W12159(with slide).

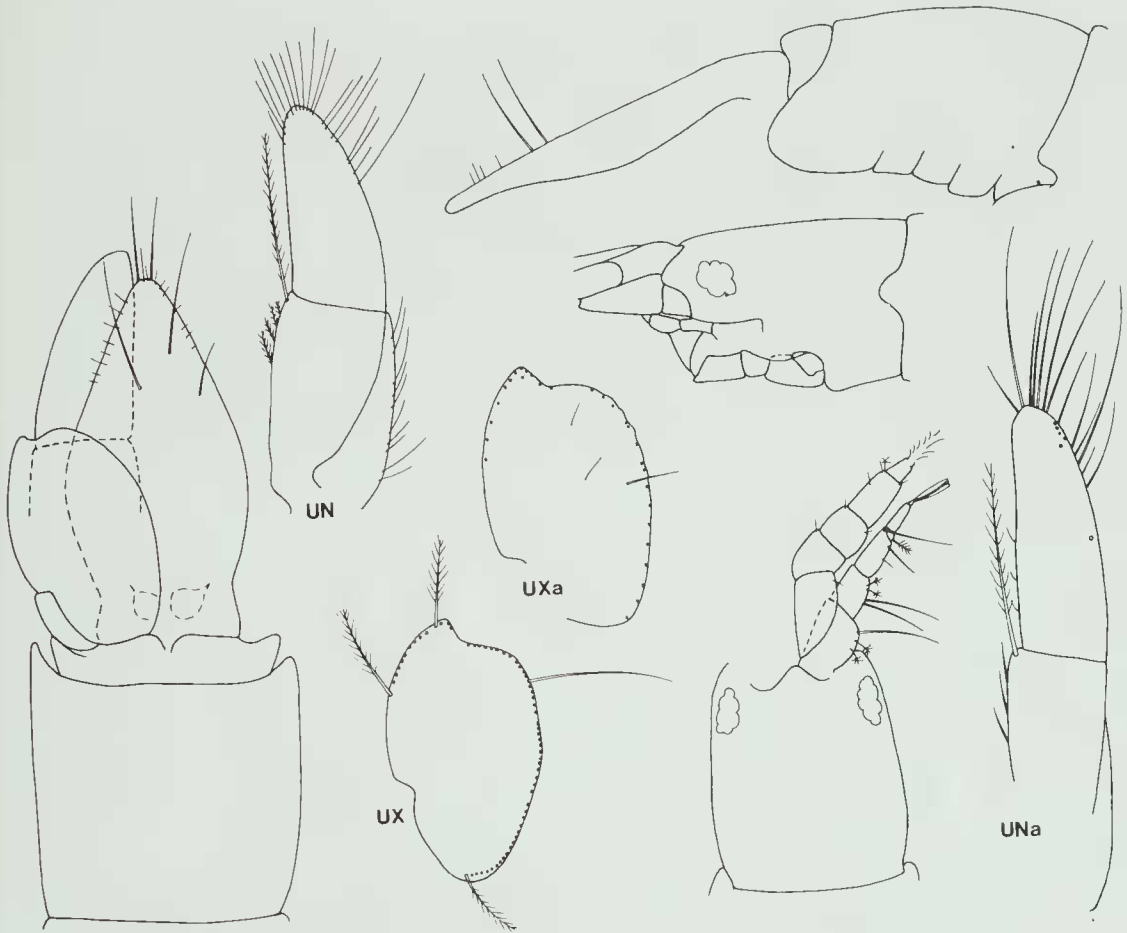


Figure 31. *Apanthura pultenaea*. Holotype juvenile; a, juvenile, 4.4 mm, NMV J12398.

Coral Sea Territory, Magdelaine Cays (16°30'S, 150°15.5'E), N.L. Bruce, 26 Apr 1979.

Paratypes. Coral Sea Territory, type locality, QM W12161(1); Lizard Is. (14°40'S, 145°28'E), B. Kensley, NMV J12432-J12446(77 including 2 males).

Other material. Qld, Heron Is. (23°27'S, 151°55'E), N.L. Bruce, QM (1).

NT, New Year Is. (10°54'S, 133°02'E), NTM Cr4063(male). McCluer Is. (11°06'S, 133°00'E), NMV J12451(1). East Point, Fannie Bay (11°24'S, 13°48'E), NMV J12448(1), J12449(male), J12452(2), NTM Cr4064(3), Cr4065(2). Locality unspecified, NMV J12450(1).

Diagnosis. Head, pereonites, pleon and telson with dorsal brown pigment patches. Antenna 1 peduncle with 2 long setae on article 2. Pereopod 1 carpus with blunt tooth; propodus palm axial proximally, with mid-distal rugose tooth closing on protuberance on dactyl, with 6 mesial setae. Pereopod 2 merus with straight posterior margin; carpus with

straight posterodistal margin; propodus rectangular. Pereopods 4-7 with only few posterior setae on merus and carpus. Uropodal endopod with continuous row of setae along lateral and distal margin; 1.5 times as long as wide. Exopod 1.8 times as long as wide, ventrodistal lobe broadly acute, very shallow concavity separates dorsal lobe. Telson as long as pleon, twice as long as greatest width, broad proximally and tapering from midpoint to rounded apex, flat except for slight proximal dome, few dorsal setae distally.

Male. Head with strongly anteriorly produced chin, enlarged eyes. Antenna 1 flagellum of 7 articles with 0, 4, 7, 2, 0, 2, 2 aesthetascs respectively. Pereopod 1 propodus palm elongated, with pronounced tooth, dactylus with enlarged tooth. Pereopods 2-7 more elongate than in juvenile.

Distribution. Coral Sea, Great Barrier Reef and Northern Territory coral islands.



Figure 32. *Apanthura pultenaea*. Holotype juvenile.

Remarks. *Apanthura stipa* is immediately recognised by its patterned pigmentation and broad telson. The species is similar to *A. childi* (Kensley) originally described as a species of *Mesanthura* because of its pigmentation. This Fijian species differs in lacking a tooth on the palm of pereopod 1.

Most of the material from the Northern Territory differed from the types in a slightly narrower uropodal exopod but this was not the case for all.

The males of *Apanthura stipa* and of *A. childi* differ from those of most *Apanthura* in possessing few aesthetascs on each antennal article. Although juveniles are, like *A. restio*, compatible with those of *Apanthura* species-group 1 male pereopods are only slightly modified.

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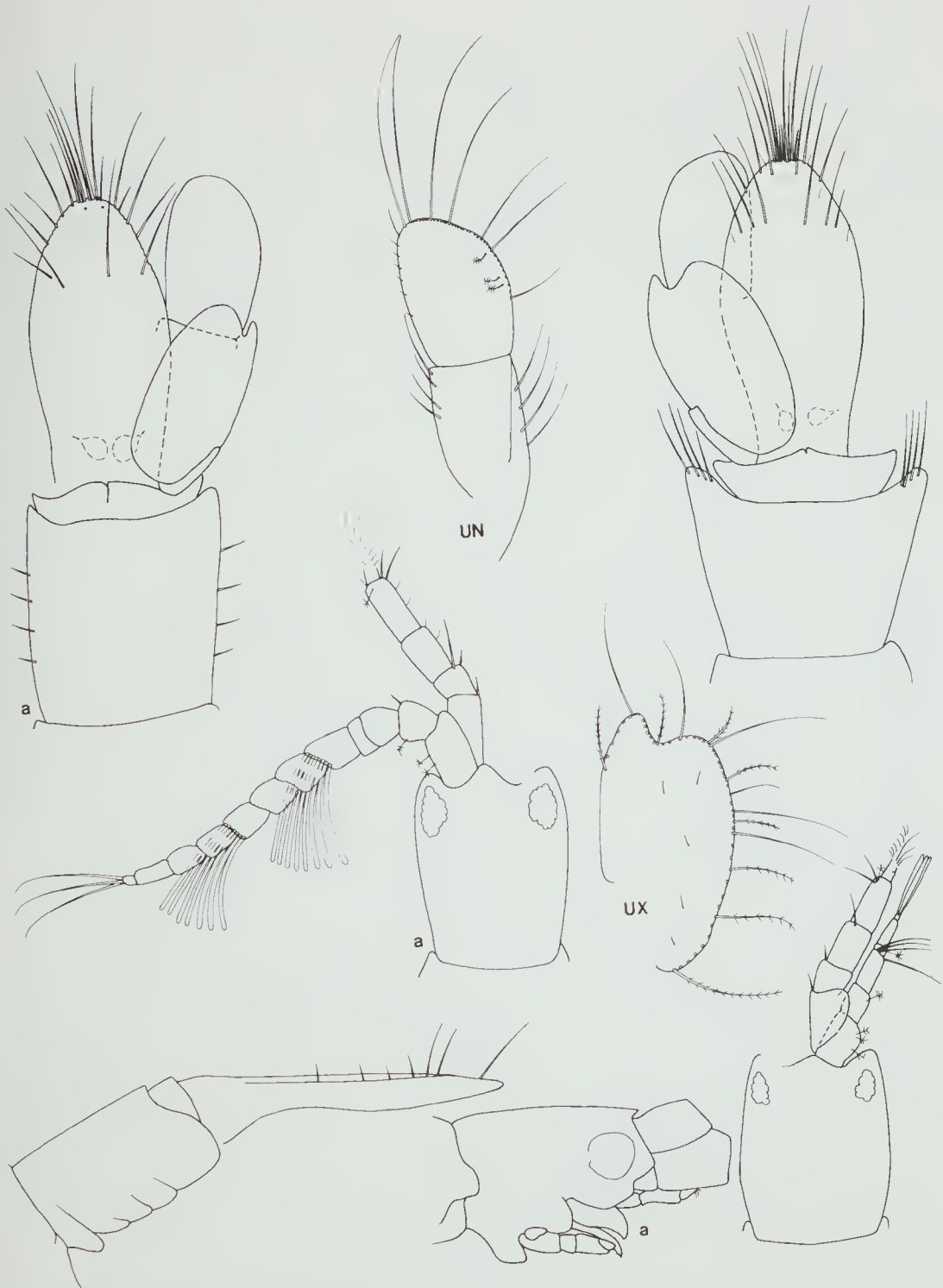


Figure 33. *Apanthura restio*. Holotype juvenile; a, paratype male, 7.0 mm, QM W12155.



Figure 34. *Apanthura restio*. Holotype juvenile; a, paratype male, 7.0 mm, QM W12155.

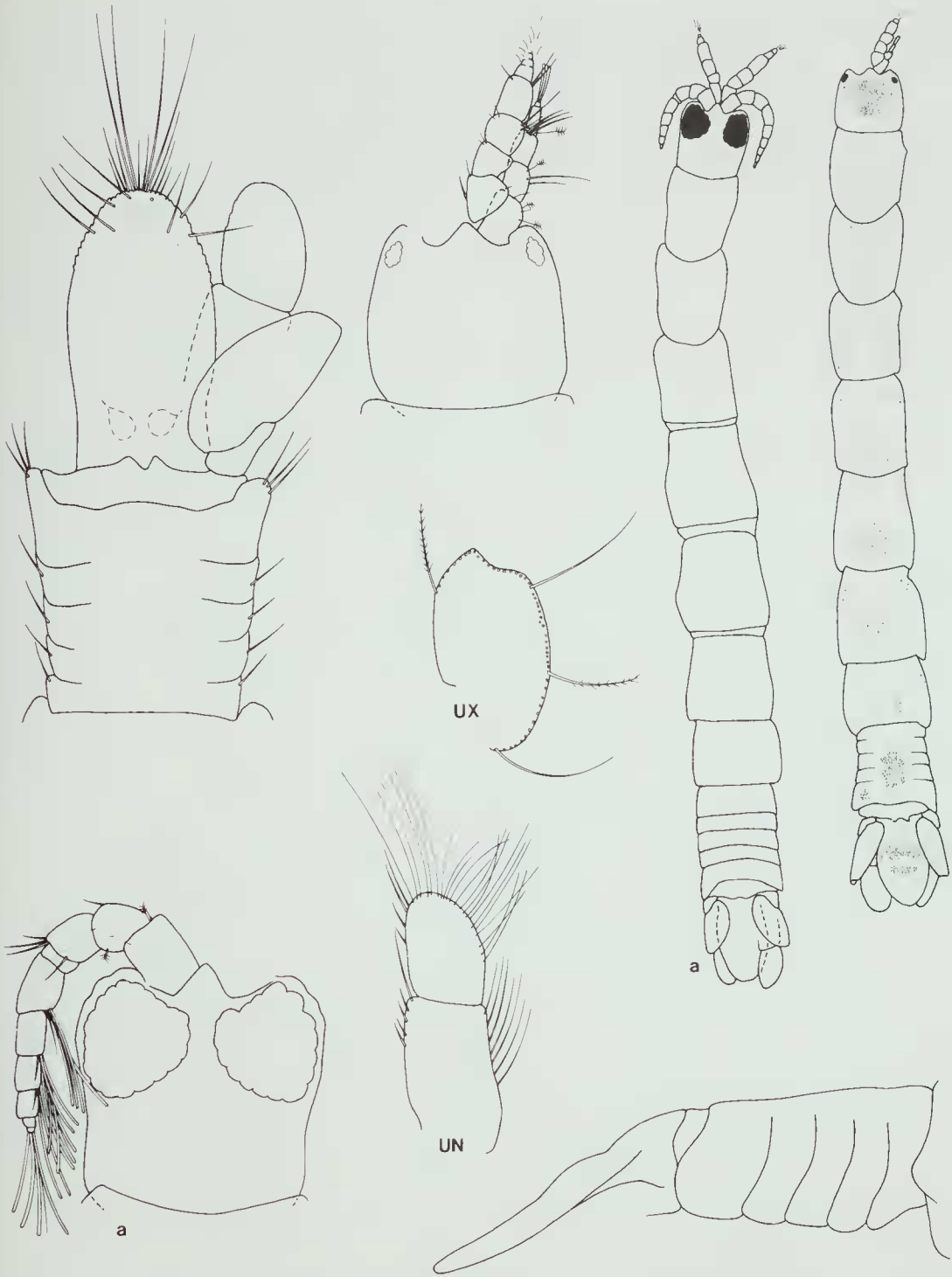


Figure 35. *Apanthura stipa*. Holotype juvenile; a, paratype male, NMV J12433.

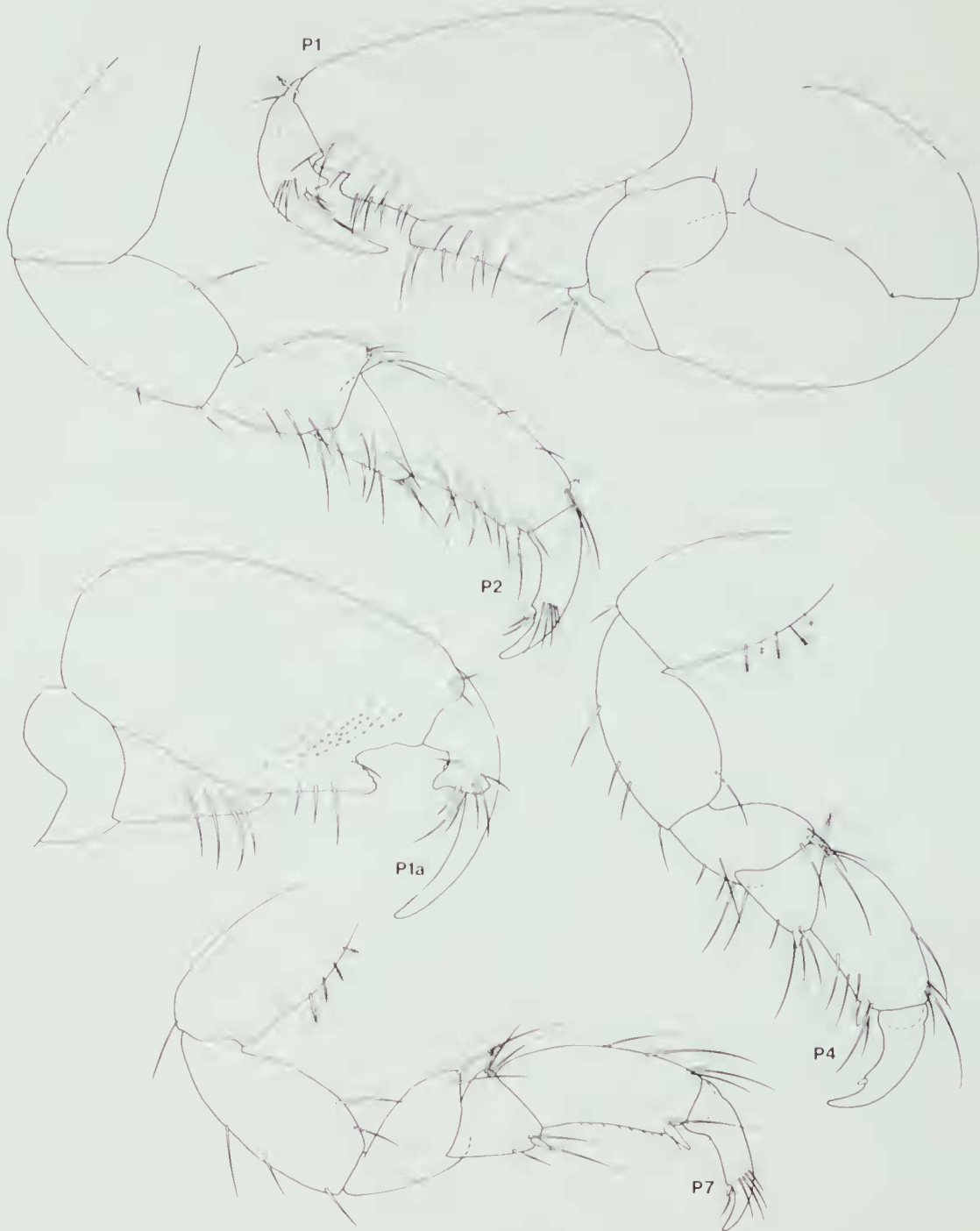


Figure 36. *Apanthura stipa*. Holotype juvenile; a, paratype male, NMV J12433.

References

- Barnard, K.H., 1925. A revision of the family Anthuridae (Crustacea Isopoda), with remarks on certain morphological peculiarities. *Journal of the Linnean Society* 36: 109-60.
- Haswell, W.A., 1881. On some new Australian marine Isopoda. Part 1. *Proceedings of the Linnean Society of New South Wales* 5: 470-81.
- Haswell, W.A., 1884. A revision of the Australian Isopoda. *Proceedings of the Linnean Society of New South Wales* 9: 1001-14.
- Kensley, B., 1980. Records of anthurids from Florida, Central America, and South America (Crustacea: Isopoda: Anthuridae). *Proceedings of the Biological Society of Washington* 93: 725-742.
- Miers, E.J., 1884. Crustacea. pp. 178-322 in *Report on the Zoological Collections made in the Indo-Pacific Ocean during the voyage of the H.M.S "Alert", 1881-1882*. British Museum (Natural History): London.
- Nierstrasz, H.F., 1941. Die Isopoden der Siboga-Expedition. IV. Isopoda Genuina. III. Gnathiidea, Anthuridea, Valvifera, Asellota, Phreaticoidea. *Siboga-Expedition* 32d: 231-308.
- Nunomura, N., 1977. Marine Isopoda from Amakusa, Kyushu (I). *Publications from the Amakusa Marine Biological Laboratory* 4: 71-90.
- Poore, G.C.B., 1984. *Paranthura* (Crustacea, Isopoda, Paranthuridae) from south-eastern Australia. *Memoirs of the Museum of Victoria* 45: 33-69.
- Kensley, B. and Poore, G.C.B., 1982. Anthurids from the Houtman Abrolhos Islands, Western Australia (Crustacea: Isopoda: Anthuridae). *Proceedings of the Biological Society of Washington* 95: 625-636.
- Poore G.C.B. and Lew Ton, H.M., 1985. *Apanthura*, *Apanthuretta* and *Apanthuropsis* gen. nov. (Crustacea: Isopoda: Anthuridae) from south-eastern Australia. *Memoirs of the Museum of Victoria* 46: 103-51.
- Wägele, J.W., 1981a. Zur Phylogenie der Anthuridea (Crustacea, Isopoda) mit Beiträgen zur Lebensweise, Morphologie, Anatomie und Taxonomie. *Zoologica, Stuttgart* 132: 1-127.
- Wägele, J.W., 1981b. Study of the Anthuridae (Crustacea: Isopoda: Anthuridea) from the Mediterranean and the Red Sea. *Israel Journal of Zoology* 30: 113-59.